

Final Report of the Study of Adequacy of Funding for Education in Maryland

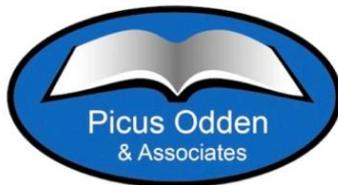
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By

APA Consulting

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AUGENBLICK,
PALAICH AND
ASSOCIATES



MARYLAND
EQUITY PROJECT
ADVANCING EDUCATIONAL OPPORTUNITIES

In 2002, the Maryland General Assembly enacted Chapter 288, the Bridge to Excellence in Public Schools Act. The Act established new primary state education aid formulas based on adequacy cost studies. These adequacy cost studies, conducted in 2000 and 2001 under the purview of the Commission on Education Finance, Equity, and Excellence, employed the professional judgment and successful schools methods and other education finance analytical tools. State funding to implement the Bridge to Excellence in Public Schools Act was phased-in over six years, reaching full implementation in fiscal year 2008. Chapter 288 requires that a follow-up study of the adequacy of education funding in the State be undertaken approximately 10 years after the enactment of the Bridge to Excellence in Public Schools Act. The study must include, at a minimum, (1) adequacy cost studies that identify (a) a base funding level for students without special needs and (b) per pupil weights for students with special needs, where weights can be applied to the base funding level, and (2) an analysis of the effects of concentrations of poverty on adequacy targets. The adequacy cost study must be based on Maryland's College and Career Ready Standards (MCCRS) adopted by the State Board of Education, and include two years of results from the new state assessments aligned with the standards. These assessments were first administered statewide in the 2014-2015 school year.

There are several additional components that are mandated for inclusion in the study. These components include evaluations of (1) the impact of school size, (2) the Supplemental Grants program, (3) the use of Free and Reduced Price Meals eligibility as the proxy for identifying economic disadvantage, (4) the federal Community Eligibility Provision in Maryland, (5) prekindergarten services and the funding of such services, (6) equity and the current wealth calculation, and (7) the impact of increasing and decreasing enrollments on local school systems. The study must also include an update of the Maryland Geographic Cost of Education Index.

APA Consulting, in partnership with Picus Odden & Associates and the Maryland Equity Project at the University of Maryland, must submit a final report to the State no later than November 30, 2016.

This final report presents the findings of Augenblick, Palaich and Associates' (APA) adequacy analysis for the State of Maryland. The APA study team's estimate of the cost of an adequate education in Maryland used three approaches for estimating adequacy, the results of which were crafted into a single adequacy recommendation for the State. The study team also developed recommendations for a new funding formula incorporating its adequacy recommendation and a model to analyze the impacts of the proposed school funding formula on the State and on individual school districts.

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Executive Summary

The *Final Report of the Study of Adequacy of Funding for Education in Maryland* presents the findings of Augenblick, Palaich and Associates' (APA) adequacy analysis for the State of Maryland. The APA study team's estimate of the cost of an adequate education in Maryland used three approaches for estimating adequacy, the results of which were crafted into a single adequacy recommendation for the State. The study team also developed recommendations for a new funding formula incorporating its adequacy recommendation and a model to analyze the impacts of the proposed school funding formula on the State and on individual school districts.

This report is the culmination of two years of work by the study team to estimate the cost of an adequate education in Maryland and to conduct a number of related analyses required in the State's Request for Proposals (RFP).

State Context

There are 879,601 students in grades prekindergarten through 12 enrolled in 24 school districts in the State of Maryland.¹ Sixty-one percent of all students are racial or ethnic minorities. The proportion of students receiving specialized services includes 44.6 percent who are low income as measured by eligibility for the federal free and reduced-price lunch program, 7.9 percent who receive limited English proficiency services, and 11.3 percent who receive special education services.

Of the State's 24 school districts, 23 are county-based and the remaining district serves Baltimore City. There is a wide range in district enrollment, ranging from 2,029 students in Kent County to 156,380 in Montgomery County. Six districts enroll more than 50,000 students and three districts enroll more than 100,000 students. All of the districts are fiscally dependent, meaning that they do not have to raise their own tax revenues but rely on local appropriations from the county or city in which they are located.

In 2010, Maryland adopted new Common Core-based State standards, the Maryland College and Career Ready Standards, and in the 2014-15 school year, they began administering the Partnership for Assessment of Readiness for College and Careers (PARCC) assessments statewide.

In fiscal year 2015, Maryland spent more than \$5.8 billion on its major state education aid programs,² while local jurisdictions contributed another \$5.7 billion in local appropriations for education, totaling \$11.5 billion in State and local support for prekindergarten through grade 12 education.

¹ Enrollment and demographic information are taken from the 2016 Maryland State Report Card found at: <http://reportcard.msde.maryland.gov>

² Total State spending includes the foundation, compensatory education, limited English proficiency, and special education programs; student transportation; guaranteed tax base; net taxable income grants; supplemental grants; declining enrollment grants; and the State share of teachers' retirement costs.

Study Context

APA carried out a similar adequacy study for the State in 2000 and 2001 under the direction of the Commission on Education Finance, Equity, and Excellence, also known as the Thornton Commission. The 2002 legislation resulting from that study, the Bridge to Excellence in Public Schools Act, significantly increased state support for education and established the school finance formulas that are still used to allocate resources to county boards of education and the Baltimore City Public Schools today. The state aid distributed through these formulas is primarily based on differences in student enrollment, student need, and local wealth. The 2002 Act also required a follow-up study of the adequacy of education funding in the State to be undertaken approximately 10 years after its enactment.

Current School Finance System

The new school funding formula established by the Bridge to Excellence in Public Schools Act retained the foundation style funding formula previously used by the State but set a level of funding based on adequacy. Foundation formulas set a minimum per student amount of funding, known as the foundation amount, which is multiplied by the count of eligible students to generate a total foundation program funding amount. The foundation amount set by the Act was based on the adequacy recommendations from the Thornton Commission study. The adequacy of the foundation amount was to be maintained by adjusting it for inflation annually. However, recent state budget shortfalls have curtailed the inflationary increases. In fiscal year 2015 the foundation level was set at \$6,860 per student. In addition to an inflation adjustment, the Act also called for the development of a Maryland specific geographic cost of education index (GCEI) for adjusting the foundation total program amount to account for regional cost differences. The GCEI adopted by the State in 2005 takes into account regional cost differences in professional district salaries, non-professional district salaries, energy, and other instructional costs. As implemented, the index is truncated at 1.0, or the statewide average cost, which provides additional funding for districts in high-cost regions but does not make corresponding reductions for districts in low-cost regions. The additional funding generated by the GCEI consists entirely of state aid.

Like other foundation funding formulas, Maryland's formula attempts to reduce the amount of disparities in education funding due to differences in local wealth through "wealth equalization." To accomplish wealth equalization, Maryland's foundation formula specifies a uniform local contribution rate that is multiplied by a jurisdiction's local wealth to determine its local share of total program. Jurisdictions with less local wealth generate a smaller local share and receive a larger share of total program funding in aid provided by the State. Conversely, jurisdictions with greater wealth generate a larger local share and receive a smaller share of state aid. The local contribution rate is designed so that, on average across all local jurisdictions, state aid comprises half of the total program funding amount. The measure of local wealth that the local contribution rate is applied to consist of the real and personal property assessable value in the jurisdiction plus its total net taxable income (NTI).

Maryland uses a similar formula for calculating total program funding for three state aid programs used to support students with special needs: 1) the compensatory education program for serving at risk

students, 2) the limited English proficiency (LEP) program,³ and 3) the special education program. The per student program funding amount for these three programs is determined by multiplying the per student foundation amount by a weight to account for the additional costs of educating these students. The program amounts for these three funding programs are also wealth equalized to account for differences in local wealth. Unlike the foundation program, local jurisdictions are not required to appropriate a local share for these three programs.

Table 1 shows the student count, special needs program weights, and per pupil total program amounts for the foundation, compensatory education, LEP, and special education funding formulas. On average across all districts, the State funds 50 percent of these total program amounts, although the percentage in any given district will vary based on the jurisdiction’s local wealth. Local jurisdictions are required to provide a local appropriation for the foundation total program but not for the other total program amounts.

Table 1
FY 2015 Formula Components

Program	Student Count	Weight	Per Pupil Total Program Amount
Foundation	FTE* Enrollment Grades K-12	N/A	\$6,860
Compensatory Education	Eligible for Federal Free and Reduced- Price Lunch	0.97	\$6,654
Limited English Proficient	Eligible for Program Services	0.99	\$6,791
Special Education	Eligible for Program Services	0.74	\$5,076

*Full-Time Equivalent

A minimum amount of state aid is also guaranteed for each of these programs. The minimum state aid guarantee for the foundation program is 15 percent of total program funding. The minimum state aid guarantee for each of the three special needs programs is 40 percent of the state share of funding.

Maryland’s funding system includes several other major funding programs, each of which is listed below:

- **Guaranteed tax base (GTB):** the GTB provides a financial incentive for jurisdictions with less than 80 percent of the statewide average local wealth per pupil to increase their local education appropriation. These jurisdictions may receive up to 20 percent of the per pupil foundation amount in additional state aid;

³ Limited English proficiency (LEP) students are also commonly referred to as English language learners (ELL). Maryland’s funding system refers to these students as LEP students. For the sake of consistency in this report, they will be referred to as LEP students throughout.

- **net taxable income education grants:** when the federal government changed the federal income tax extension filing deadline from August to October, the State conformed to this schedule for state income tax purposes. Beginning in fiscal year 2014, the State began calculating state aid using both the September and November net taxable income totals for local jurisdictions. The State then uses the NTI which produces the largest state aid amount. If the November NTI-based aid amount is larger, districts receive the difference in additional state aid. This increase in state aid was to be phased-in over a five-year period;
- **grants to counties with declining enrollment:** assists smaller districts with declining enrollment by providing a state grant equal to 50 percent of the decrease in state education aid from the prior year. Only two districts meet the grant program's eligibility criteria;
- **supplemental grants:** beginning in fiscal year 2009 supplemental grants were paid to ensure that all districts received at least a one percent annual increase in state funding following a freeze of the per pupil foundation in fiscal years 2009 and 2010. The grant amounts paid to nine districts were frozen beginning in fiscal year 2011; and
- **student transportation:** state aid for student transportation is based on a district's prior year grant with adjustments for inflation and increases in enrollment. Districts are guaranteed a minimum annual increase of one percent.

New Adequacy and Related Studies

In March 2014, the Maryland State Department of Education (MSDE) issued an RFP for the follow-up adequacy study required by the Bridge to Excellence in Public Schools Act. The study was to include, at a minimum, adequacy cost studies that identified a base funding level for students without special needs, 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 was to be based on the requirements of the Maryland College and Career Ready Standards adopted by the State Board of Education.

Augenblick, Palaich and Associates (APA), in partnership with Picus, Odden and Associates (POA) and the Maryland Equity Project (MEP) at the University of Maryland, were selected to conduct the study. The RFP required the consultants to undertake a broad analysis including the following tasks:

- Conduct an adequacy study using at least two approaches;
- calibrate the study to identify the funding required to implement the Maryland College and Career Ready Standards;
- identify a per pupil base level of funding and per pupil weights for students with special needs, such as economically disadvantaged students eligible for the federal free and reduced-price lunch program (FRPM), students with limited English proficiency (LEP), and students eligible for special education services;
- analyze the effects of concentrations of poverty on the adequacy estimates;
- identify gaps in growth and achievement among student groups and make recommendations of programs that might address these gaps;
- find possible relationships between student performance and funding deficits;

- assess the impact of quality prekindergarten on school readiness as a factor in the adequacy estimates;
- make recommendations on any other factors to be included as part of the adequacy study; and
- conduct a review of adequacy studies carried out in other states and report on best practices and recommendations for the Maryland study.

Approaches to Adequacy

The concept of adequacy as it relates to education funding grew out of the standards based reform movement. As states implemented specific learning standards and performance expectations for what students should know, along with consequences for districts and schools failing to meet these expectations (and, eventually, federal expectations imposed through No Child Left Behind and continued by the Every Student Succeeds Act), the focus of school finance shifted to an examination of the resources necessary to provide districts, schools, and students with reasonable opportunities to achieve state standards. Over the past two decades, researchers have developed four approaches to creating estimates for the level of funding necessary to provide all students with the opportunity to receive an adequate education. APA and its partners employed the first three approaches to estimate adequacy in Maryland:

1. The **evidence-based (EB)** approach was developed by Picus, Odden, and Associates. The EB approach assumes that information from research can be used to define the resource needs of a prototypical school or district to ensure that the school or district can meet state standards. The approach not only estimates resource levels but also specifies the programs and strategies by which such resources could be used efficiently. The costs are then estimated using a model of prototypical schools and a district central office. The EB approach conducts case studies of existing high-performing schools in the State and convenes multiple panels of state educators to review the EB model to ensure that it is consistent with the State's context. The EB approach is used to identify a base cost figure and adjustments for special needs students. In Maryland, the study team conducted case studies of 12 high-performing schools and convened four educator panels across the State.
2. The **professional judgment (PJ)** approach was first used in Wyoming in the mid-1990s and has since become one of the most widely used adequacy approaches. The PJ approach begins with evidence-based research but relies on and defers to the experience and expertise of educators in the State to identify the resources needed to ensure that all districts, schools, and students can meet state standards and requirements. Resources include school-level personnel, non-personnel costs, additional supports and services, technology, and district-level resources. The costs of these resources are then estimated via a cost model based on schools and district central offices representative of school and district sizes in the State. The PJ approach identifies both a base cost and adjustments for special needs students. Nine panels of Maryland educators were convened, ranging from school-level to state-level perspectives, to develop the PJ model.

3. The **successful schools/school district (SSD)** approach was developed by APA. The SSD approach determines an adequate per pupil base cost amount by using the actual expenditure levels of schools or school districts that are currently outperforming other schools on state performance objectives. This approach assumes that every school and school district, in order to be successful, needs the same level of base funding that is available to the most successful schools and districts. However, the SSD approach does not necessarily indicate what it would take for a school and its students to meet all state requirements. The SSD approach is only able to look at the base spending amount for a student with no additional needs, due to limitations on collecting expenditure data on special needs students. Finally, the SSD approach does not provide the study team with detailed information on the types of programs or interventions being employed by the schools. SSD studies are typically conducted at the district-level, but because Maryland has only 24 districts, this study examined school-level expenditures. Seventy-two schools representing 10 districts were selected for the study.

4. The fourth approach, the **cost function or statistical (CF)** approach, is an econometric method that estimates the level of funding needed to achieve a given level of student achievement as measured on assessments while controlling for student and district characteristics. The cost function approach was not used because it consists of a district-level statistical model that requires a much larger number of districts than the 24 districts in Maryland to produce reliable results. Also, due to its complexity and use of econometric modeling techniques, this approach has proven difficult to explain in situations other than academic forums.

Table 2 summarizes the three approaches APA used for developing its adequacy estimates for Maryland.

Table 2
Summary of Three Approaches to Adequacy Used by APA

	Evidence-Based	Professional Judgment	Successful Schools/Districts
Benchmark of Success	Ensuring students can meet all State standards	Ensuring students can meet all state standards	Currently outperforming other Maryland schools
Data Source	Best practice research, reviewed by Maryland educators; when conflict arises in resource recommendations, the EB approach defers to the research	Expertise of Maryland educators serving on PJ panels; uses research as a starting point but defers to educators when conflict arises in resource recommendations	2014-15 expenditure data from selected successful schools
Available Data Points			
Base	Yes	Yes	Yes
Student Adjustments (Weights)	Yes	Yes	No

Reconciling Adequacy Approaches

The different perspectives of the three approaches used by the study team to estimate an adequate education in Maryland led to differing results. Table 3 shows the estimated base cost and weights for students with special needs for each of the three approaches and compares them to current funding.

Table 3
Base and Weights by Different Study Approach

	2014-15 Maryland	Evidence-Based	Professional Judgment	Successful Schools
Base Cost	\$6,860	\$10,551	\$11,607	\$8,716
Weights				
Compensatory Education (At risk)	0.97	0.30	0.36	N/A
Limited English Proficient	0.99	0.38	0.61	N/A
Special Education	0.74	0.70	1.18	N/A
Prekindergarten		0.40	0.26	

The study team felt that the best benchmark of success for developing a single adequacy figure in Maryland was to identify the resources needed not just to outperform other districts today but to reach the higher benchmark of ensuring all students have the opportunity to achieve all state standards.

Therefore, the study team recommends that an adequacy base cost figure be derived from the EB and PJ approaches. While the study team does not believe the SSD figure fully represents the cost of adequacy, it does present an important reference point for phasing in a new funding system, if necessary.

The EB and PJ approaches produced relatively similar base cost figures: the EB base is \$10,514 and the PJ base is \$11,607. However, larger differences existed in the weights for special needs students. In reviewing the EB and PJ resource models, the study team identified five important resource areas driving the differences in the estimates generated by the two approaches:

- Elementary school teacher-to-student ratios;
- middle school teacher preparation time;
- school administration staffing, specifically assistant principals;
- school-level student support services; and
- inclusion of CTE resources in the models.

The study team reviewed the resource differences and made a recommendation in each area to create an adjusted model for each approach. It is important to note that the study team was not attempting to create a specific model for implementation but instead was reconciling the largest resource differences in order to create a single cost estimate. The study team also examined differences in the resources included in each model for determining special needs weights, particularly for the LEP and special education weights, which differed the most, and used professional judgment panel and school case study information to determine new, blended weights.

This analysis resulted in a single estimate of an adequate per pupil base cost and weights. These figures were further adjusted to account for federal education funds and a net base cost and weights were calculated. Table 4 presents the study team’s final estimate of an adequate base cost and weights.

Table 4
Final Adequacy Base and Weights

Final Estimates	
Base Cost	\$10,880
Weights	
Compensatory Education	0.35
Limited English Proficient	0.35
Special Education	0.91
Prekindergarten	0.29

These estimates represent a significant shift from the current funding model used in Maryland. The per pupil base cost presented here is much higher than the current Maryland base of \$6,860 for fiscal year 2015 and includes a significantly higher level of supports and services for all students, which was a recurring theme voiced by the PJ panels in discussions of specific resources. Conversely, the estimated weights for students with special needs are considerably lower than current weights, with the exception of the weight for special education. This change is a result of the much higher base cost and the expectation that a higher level of services will be provided through the base cost allocation. Both the EB

and PJ approaches, and thus the resulting blended base figure, represent an important shift toward allocating more resources through the base cost to provide a higher level of services to all students regardless of need.

Recommendations

The study teams' recommendations result in a significant increase in the state's investment in prekindergarten through grade 12 education. However, they also change the way in which funding is allocated through the funding formulas and the distribution of state and local shares across districts. Although implementing these recommendations will present some challenges, the recommendations reflect the professional judgment of educators across the State, the findings of a wide range of research literature, and are consistent with the results of numerous adequacy studies conducted across the country over the past decade. The study team believes these changes are necessary for Maryland's students to significantly increase their performance on the new state standards and assessments. In the first year of statewide administration of the PARCC assessments, an average of 57 percent of students met or exceeded proficiency in math and 65 percent of students met or exceeded proficiency in reading. The changes to the formula recommended here are geared toward increasing the number of students meeting these new, higher standards. Other factors also drive the need for these changes, such as the increased costs of the State's new educator evaluation system, the need for more extensive student supports for all students, and improved funding equity.

The study team thinks of the recommended formula in two parts. The first part is the calculation of district adequacy targets. This includes determining: (1) the student counts that are used, (2) the base amount of funding per pupil, (3) the adjustments for special needs students (including special education, compensatory education, and LEP students), and (4) any adjustment for regional cost of living differences. The calculation of an adequacy target is done outside any considerations of the state and local responsibilities to pay for the adequacy target.

The second part of the formula revision focuses on the state and local shares for paying for the adequacy target. Recommendations include: (5) how to measure each district's capacity to pay for the adequacy target, and (6) if any minimum state aid guarantees should be included and whether local jurisdictions should be required to appropriate the local share of special needs programs. Combining the adequacy targets with the calculation of funding sources allows the study team to compare the current funding system to the recommended system.

Calculating District Adequacy Targets

To calculate a district's total adequacy target, regardless of the state or local share, student counts are multiplied by the base cost and special needs adjustments and then adjusted for regional cost differences. The decisions for each of these key components of calculating adequacy targets are described below.

Student Counts

The study team recommends changes to current student count methods for: (1) addressing declining enrollments for general education formulas, (2) counting low-income students for compensatory total program, and (3) including prekindergarten students in the State's full-time equivalent enrollment counts to provide universal prekindergarten services.

The study team recommends retaining the same general student count methods used for the current formulas, including total FTE enrollment, compensatory education students, LEP students, special education students, and prekindergarten students. Our recommendations for addressing declining enrollment, counting compensatory education students, and counting prekindergarten students are presented below.

Declining Enrollment

The study team recommends including a declining enrollment calculation when calculating total enrollment for each district. Currently, total enrollment is based on the September 30 FTE enrollment count for the prior school year. The November 2015 *Final Report of the Study of Increasing and Declining Enrollment in Maryland schools* discusses the reasoning for a declining enrollment adjustment. Generally speaking, as a district loses enrollment, it cannot necessarily reduce costs in a fashion that is proportional to the loss of students. The proposed methodology would use three years of enrollment information in the calculation of the total enrollment figure, allowing districts to absorb the loss of funding related to the loss of students over time. A district would receive the greater of two counts — the prior year's enrollment count or the average of the three prior years' counts. The calculation ensures that districts with growing enrollments receive funding based on the most recent enrollment count. Table D.1 in Appendix D shows the effect on enrollment numbers and funding by using the greater of a single year or a three-year rolling average or just implementing a single year count. The recommended method increases student enrollment in 10 of the 24 districts. Also, the proposed enrollment count results in higher total funding by \$11,468,199 compared to using the single year enrollment count

Counting Low-Income Students

The issue of how to best count low-income students was raised as a result of the growing use of the Community Eligibility Provision (CEP) included in the 2010 Healthy, Hunger-Free Kids Act (HHFKA), which allows eligible⁴ participating schools to serve free meals to all of its students. In a move to reduce reporting burdens on schools, the law prohibits participating schools from collecting application forms for the federal free and reduced-price lunch program during the four-year CEP eligibility period, which results in incomplete district and statewide FRPM counts.

⁴ Schools are eligible for CEP if 40 percent or more of its students have been identified as being vulnerable to hunger during the spring of the prior school year. Among the factors that may be used to identify children are homelessness, placement in foster care, participation in Head Start, migrant status, and living in households receiving services from the SNAP, FDPIR, or TANF programs.

In July 2015 the study team released the report entitled *Evaluation of the Use of Free and Reduced-Price Meal Eligibility as a Proxy for Identifying Economically Disadvantaged Students: Alternative Measures and Recommendations*. The report examined the various options for identifying students for compensatory education funding. It attempted to identify the best count for compensatory education generally and with a focus on the potential impact of CEP program, which would suspend FRPM counts in eligible schools for up to four years. The implication of CEP is that students no longer need to complete the federal form required to qualify for FRPM in these schools, creating an undercount of FRPM students and, in turn, an undercount of low-income students.

The report discusses the impact of this provision on student counts. The study team recommended using either of two alternatives from the various approaches examined in the report. The first alternative, which is the preferred approach, is to continue to use FRPM eligibility to identify students for compensatory education funding but use an alternative state-developed form for collecting FRPM eligibility information. The second of the two alternative recommendations relies on direct certification of students eligible for programs such as the Supplemental Nutritional Assistance Program (SNAP), Transitional Assistance for Needy Families (TANF), or Medicaid using existing administrative data from state and local social services agencies.⁵ However, the statewide direct certification count is much lower than the current FRPM count, about 56 percent of the FRPM count, and would result in significantly less compensatory education funding. An adjustment factor could be applied to the direct certification count to generate a statewide eligibility count comparable to the current FRPM count, but counts at the district-level would still vary significantly from current counts. Due to this redistribution in the compensatory education eligibility counts, any implementation of direct certification should be phased-in over time. The study team recommends using the first alternative, in which the State creates an alternative form for collecting FRPL eligibility information because this approach will continue to provide a comprehensive count while minimizing the redistribution of counts across districts.

Counting Prekindergarten Students

Maryland currently provides funding for prekindergarten students who meet specific qualifying criteria related to the income of the child's family. In the January 2016 report entitled *A Comprehensive Analysis of Prekindergarten in Maryland*, the study team identified the need to expand the coverage and the quality of prekindergarten services in the state to ensure students would be prepared to meet the MCCRS. The report recommends a goal of providing high-quality prekindergarten for all four-year-old children. Though offered to all families, it is expected that no more than 80 percent of families with four-year-old children will participate. To be eligible for state funding, four-year-old prekindergarten students must be enrolled in a "quality" program, which is defined as a program that is six and a half hours long and located in a public or private setting that: 1) has earned an EXCELS⁶ rating of level 5, 2) has earned state or national accreditation (for example, accreditation through the National Association

⁵ The recommendation suggests including eligibility for Medicaid or the Children's Health Insurance Program among the criteria used for determining eligibility if the direct certification method is chosen.

⁶ Maryland uses a Quality Rating and Improvement System (QRIS) called EXCELS to accredit prekindergarten providers.

for the Education of Young Children), or 3) is a public school program which must, at a minimum, meet EXCELS level 5 standards.

In September 2013, the total public prekindergarten enrollment reported by local school districts was 29,724. After adjusting the school district figures to convert half-day programs to their full-day equivalent, the number of full-day public program spaces available in the State is 26,631. In addition, most, though not all, districts have private EXCELS Level 5 and accredited programs within their boundaries. This adds 1,607 EXCELS Level 5 full-time slots and 4,413 accredited full-time slots that are eligible for funding. This approach would recognize 32,651 prekindergarten slots as being eligible for funding through the foundation formula, which is the funding method recommended by the study team. This represents an increase of 2,927 eligible prekindergarten students in the State from the September 2013 enrollment count, or approximately 60 percent of all four-year-olds. In the modeling below, the study team uses the 32,651 count of “high-quality” slots for use in the foundation formula. This count is expected to grow over time up to 80 percent of all four-year-old children as more Level 5 slots become available.⁷

Base Cost

The base cost figure of a formula should be designed to represent the resources that a student with no special needs, in a district with no special circumstances, needs to meet state standards. The base cost includes resources for instructional, administrative, and other costs associated with meeting student needs. Maryland’s standards and requirements have changed over time, and the base cost needs to keep up with these changes to ensure all students, schools, and districts have the resources needed to meet the new standards. As will be mentioned in Chapters II-IV, the study team identified three base cost figures from the various adequacy approaches. The base cost figures from the evidence-based approach (EB) and professional judgment approach (PJ) were determined to best estimate the resources needed for all students to meet the MCCRS. The three adequacy study approaches are reconciled in Chapter V to create a final base cost recommendation based upon blending the EB and PJ approaches. This new base cost, once federal dollars were considered, was \$10,880. For comparison, the current base cost used for the 2014-15 foundation program was \$6,860.

This difference between the recommended base cost (\$10,880) and the current base cost (\$6,860) is substantial and represents a greater focus on providing resources at the base level to all students (instead of through adjustments tied to student need) than in the previous adequacy work done for the Thornton Commission, from which the current base figure is derived. The professional judgment panelists and the extensive research reviews of the EB and PJ approaches strongly argued for a larger base amount for several reasons. First, the new College and Career Ready state standards and other

⁷ The rate at which existing slots for prekindergarten students are converted to EXCELS Level 5 or its equivalent is limited by the number of prekindergarten programs that earn and move to EXCELS Level 5. To meet the goal of 80 percent of Maryland four-year-olds being served in a Level 5 program, the objective would be to have the capacity to serve approximately 60,300 four-year-olds in high-quality programs. This figure is approximately 27,650 higher than the 32,651 slots that are available today. The study team included the 32,651 figure in the recommendation estimate. The study team elected to use the lower count in recognition that it will take several more years before the number of “high quality” EXCELS Level 5 slots become available to accommodate 80 percent of four-year-olds.

state requirements are more rigorous than those in place at the time of the first study. Stronger accountability systems at both the state and federal levels also place higher stakes on adequately supporting students to meet these standards. The professional judgment panelists and research literature also indicated that most, if not all, students are coming to school with greater needs, requiring more support services even if they have not been formally identified as at risk, LEP, or special education. Further, since 2002 there are additional requirements for schools and districts, such as educator evaluations that require additional resources to accomplish.

While the study team does not intend to be prescriptive in how resources should be used, the base figure reflects the resource level needed to enable schools to provide the following key resources to meet the higher state standards and requirements, shown in Table 5.

Table 5
Base Cost Components

Key Resources in the Development of the Base Figure
Small class sizes
Staffing to support (but not limited to) the following areas: art, music, PE, world languages, technology, CTE, and advanced courses
Significant time for teacher planning, collaboration, and imbedded professional development
Additional instructional staff, including instructional coaches, and librarian/media specialists
High level of student support, such as counselors, nurses, behavior specialists, or social workers, for <u>all</u> students
Administrative staff to allow for instructional leadership, data-based decision making, and evaluation
Technology rich learning environments, resourced at a level that would allow for one-to-one student devices
Resources for instructional supplies and materials, assessment, textbooks, and student activities
District-level personnel and other resources to support schools

Weights

Student adjustments, or weights, are designed to provide the additional resources these students need above the base cost to ensure they can meet state standards. The study team is recommending the

following student need adjustments for special education, compensatory education, LEP, and prekindergarten students as shown in Table 6:

Table 6
Recommended Weights

Student Category	Weight
Compensatory Education	0.35
LEP	0.35
Special Education	0.91
Prekindergarten	0.29

The recommended compensatory education and LEP weights, both 0.35, are lower than the current weights. This is reflective of the shift to providing additional resources in the base instead of through adjustments tied to student need as discussed above. These weights were set at the level needed to raise sufficient funding when applied to the higher base to fund the additional staff and non-staff resources identified in the PJ and EB studies as necessary to adequately serve these students. The lower weights also reflect that all students, including students at risk of academic failure and students with limited English proficiency, will receive a higher level of services through the general education program due to the higher base amount. Further, both weights are recommended to be linear, that is, the weights remain constant regardless of the concentration of these students. In this final chapter of this report addressing additional studies, a discussion on funding for higher concentrations of low-income students is included. This section goes into detail on the research related to funding for concentrations of poverty and the basis for the study team’s recommendation of funding compensatory education on a linear basis. It builds on the December 2015 report *The Effects of Concentrations of Poverty on School Performance and School Resource Needs: A Literature Review* (APA, 2015). The study team recommends that regardless of a district’s percentage of compensatory education students, all eligible students receive the 0.35 weight. Districts with higher concentrations would receive more funding overall, but not more on a per student basis.

The study team concludes that at this time the evidence is not compelling to justify nonlinear funding mechanisms,⁸ even though the challenges that high-poverty schools face are readily observed. Neither the research literature nor the results from the PJ and EB studies indicate a need for a nonlinear approach. The research team believes that given the level of funding recommended by this study, Maryland’s schools would have the necessary resources for services to meet state standards, such as the supplemental strategies highlighted in the *Concentrations of Poverty* report and those highlighted in the EB and PJ approach sections of this report such as prekindergarten, summer school, after-school

⁸ Under a nonlinear weighting approach, a higher weight would be applied to districts (or schools) with higher concentrations of students in poverty. Under this approach, districts with higher concentrations of students in poverty would receive more funding per eligible student than districts with lower concentrations. Under a linear weighting approach, all students receive the same weighting (and amount of additional funding) regardless of poverty concentrations.

programs, arts education, and the coordination of wrap-around services through the use of school-based community liaisons to address the needs of these students.

Second, the study team recommends that the State continue to use a single weight for special education students. The recommended weight is 0.91, which is higher than the current weight of 0.74. The proposed weight both reflects the level of services identified by the PJ and EB studies and is in-line with recommendations made in recent adequacy studies for other states as presented in the *A Comprehensive Review of State Adequacy Studies Since 2003* report.⁹

Finally, the study team proposes a prekindergarten weight of 0.29 to fund quality prekindergarten programs for four-year-olds. The 0.29 weighting is needed to pay for the additional costs of high-quality programs. The primary cost drivers are related to staff, including higher total compensation packages required to attract and retain early childhood education certified teachers and credentialed program administrators, a small instructor-to-student ratio of one certified teacher and assistant (or two certified teachers) per 15 students, a 6.5 hour program day, planning time and ongoing professional development for staff, and time to conduct routine child screenings and assessments.

At a participation rate of 80 percent of all four-year-olds, the study team estimated a total cost of \$439.6 million with state aid accounting for 51 percent of total costs on average and local appropriations accounting for the remaining 49 percent of costs. Contributions from families based on their income is an option for offsetting part of these costs. However, the study team estimated that the State would accrue a return on investment of \$5.54 for each dollar spent through reduced special education and remedial program spending in grades kindergarten through 12 and lower criminal justice and child welfare system costs.¹⁰

Though the recommended weights may be lower than the current weights in some cases, it does not necessarily mean special needs students would receive fewer resources for two reasons. One reason is that the weights are applied to a higher recommended base. Another reason is that current weights may not be fully funded at present, as only the state share of funding for these weights is guaranteed. The study team recommends that the recommended weights from this study be fully funded. A detailed comparison of per student amounts generated under both current and recommended bases and weights will be provided later in this chapter.

As one final recommendation regarding weights, the study team recommends a student receive all weights for which they are eligible, with the exception of LEP weights for prekindergarten students.

Regional Cost Adjustment

Regional cost adjustments are applied to funding targets to account for geographical differences in the costs faced by districts across the State. There are few states that take a similar approach to Maryland's

⁹ See Aportela, A., Picus, L., Odden, A. & Fermanich, M. (2014). *A Comprehensive Review of State Adequacy Studies Since 2003*. Denver, CO: Augenblick, Palaich & Associates.

¹⁰ For more information on prekindergarten costs and return on investment, see Workman, S., Palaich, R., & Wool, S. (2016, January). *A Comprehensive Analysis of Prekindergarten in Maryland*. Denver, CO: APA Consulting.

current GCEI, Alaska and Wyoming being two examples, while most states with cost of living indices, such as Massachusetts, Missouri, New York, Virginia, and Florida, use wage indices¹¹. For example, the school funding formula in Missouri includes a Dollar Value Modifier (DVM), which is an index of the relative purchasing power of a district in order to provide additional funds to districts with higher costs of living. Missouri's DVM is calculated based upon the ratio of a regional average wage per job in relation to the state's median wage per job, and it is applied to a district's weighted average daily attendance multiplied by the state adequacy target¹². Similarly, New York uses a Regional Cost Index (RCI) to reflect regional variations in purchasing power around the state, based on wages of non-school professionals.¹³ New York's RCI is applied to a district's foundation funding amount.

Two reports were produced examining regional cost adjustments for the Maryland school funding model. In November 2015, the *Geographic Cost of Education Adjustment for Maryland* report examined the current approach used by the State, the GCEI, and the alternative approaches available for adjusting for regional cost differences. The report recommended switching from the GCEI to a Comparable Wage Index (CWI) approach for regional cost adjustments to better account for the differences in costs faced by districts in Maryland. The June 2016 report *A Comparable Wage Index for Maryland* calculated the CWI figure for each school district in the State.

As a result, the study team is recommending using the CWI figure to adjust for regional cost differences. The study team recommends all formula funds be adjusted by the CWI, which is a further change from the current funding system. Currently, only foundation funding is adjusted by the GCEI. However, regional differences in costs impact all program areas, not only programs supported by foundation funding. Additionally, the study team also recommends that adjustments be made for districts with CWI figures above and below the statewide average. Currently, adjustments are made only for those districts with GCEI figures above the state average, providing for additional funding for districts in regions with higher than average costs. By not applying GCEI figures below the state average, funding for districts in lower cost regions is not reduced, resulting in a financial advantage for these districts in the competition for attracting and retaining qualified staff. Finally, the study team recommends that the CWI adjustment be applied prior to determining the state and local shares. Currently, the GCEI adjustment is made after the local share has been calculated and the entire cost of the GCEI adjustment is included in state foundation aid. However, under this recommendation the full range of the CWI will be applied (both above and below the state average), therefore local jurisdictions should share in any savings as well as extra costs resulting from the application of the CWI.

Determining State and Local Funding

Equalized state funding systems determine state and local funding based on the wealth of each district, the required local share, any additional adjustments such as minimum aid guarantees or guaranteed tax

¹¹ Silverstein, J., Brown, A., Fermanich, M. (2015). Review of Alaska's School Funding Program. Denver, CO. Augenblick, Palaich, and Associates.

¹² *id.*

¹³ *id.*

bases, and the ability of districts to raise dollars above the foundation formula. This section examines each of the study team's recommendations for these components.

Local Wealth

The study team examined three issues related to determining the local wealth of districts: 1) the choice of using September or November Net Taxable Income (NTI), whichever provided the largest amount of state aid, when determining local wealth; 2) the method for combining local, assessed property values and NTI; and 3) whether all or a portion of the tax increment of tax increment financing (TIF) districts should be exempted from the local property wealth portion of a district's wealth for school aid formula purposes. All three of these issues are presented in more detail in APA's December 2015 report *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. The study team provided recommendation on the issues of NTI and the method used for combining assessed property values and NTI but did not make a specific recommendation related to tax increment financing.

Net Taxable Income

Currently, MSDE calculates each funding formula impacted by local wealth using both the September and November NTI. Districts receive the calculation that results in the largest amount of state aid. The study team believes that the November NTI provides the more accurate measure of NTI, and hence the fiscal capacity of each district, because it includes a larger proportion of a county's income tax returns – including those filed closer to the extension deadline of October 15. Thus, the study team recommends using only the November NTI data for determining local wealth.

Combining Assessed Property Values and NTI

Maryland, along with five other states (Connecticut, Massachusetts, New Jersey, New York, and Virginia), includes both property and income wealth in its measure of local wealth to reflect the fact that the State's local jurisdictions raise revenues through both property and income taxes. Including a measure of income when determining local wealth also enables the State to more directly account for taxpayers' ability to pay – an important factor in local tax and spending decisions (Mankiw, 1998) and improving the funding system's equity. The study team's earlier equity analysis¹⁴ showed that although Maryland's school finance system is quite equitable, high-wealth jurisdictions still generally spend more per pupil than lower-wealth jurisdictions, an indication that the finance system is not entirely fiscally neutral.¹⁵

The State's current method of combining assessable property values and NTI, the measure of income used in determining local wealth, is to add the two components together. However, adding NTI to assessable property values may not fully account for the effects of differences in NTI across jurisdictions. For example, the effect of the income measure could be overwhelmed by a much larger property wealth amount. To help ensure that the effect of variation in NTI across jurisdictions is fully accounted for, the

¹⁴ See Glenn, W. J., Griffith, M., Picus, L.O., & Odden, A. (2015). *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. Denver, CO: APA Consulting.

¹⁵ In a fiscally neutral finance system there is no relationship between a jurisdiction's wealth and per pupil spending.

study team recommends that the State consider using a multiplicative approach instead of the current additive approach for combining the two measures of wealth. Under the multiplicative approach, each county's assessed property wealth is adjusted by multiplying it by the ratio of the jurisdiction's NTI to the state average NTI. In essence, under this approach, assessed property wealth is adjusted by an income index to account for differences in jurisdictions' NTI.

Moving to the multiplicative approach helps to increase the equity and fairness of the State's school finance system by ensuring the use of NTI in the local wealth calculation works to the benefit of lower wealth jurisdictions. One of the basic tenets of a fair taxation system is the ability to afford the tax (Institute on Taxation and Economic Policy, 2011, Oates & Schwab, 2004). Under the current additive approach, the real and personal property assessable value component comprises between 60 percent and 90 percent of total local wealth. However, possessing high assessable property wealth does not necessarily mean a jurisdiction also has high taxable incomes. In Maryland, there is only a moderate correlation between the two (0.58).¹⁶ Studies also show that the property tax is regressive, with low-income families paying 3.6 percent of income in property taxes compared to 0.7 percent of income for high-income families (ITEP, 2015). The ability to pay property taxes may also change over time. For example, seniors may find it difficult to pay the property taxes on their home once retired and living on a fixed income (Oates & Schwab, 2004). Some states, including Maryland, have attempted to address this by providing some property tax relief through an income-based circuit breaker (Lyons, Farkas, & Johnson, 2007).

The examples of Calvert and Montgomery Counties help to illustrate how the multiplicative approach would change local wealth amounts. Calvert County's average assessable property wealth per student is almost equal to the state average at just over 100.0 percent. However, the county's November NTI per student is only 85.2 percent of the state average. Using the State's current additive method, the county's total November wealth measure is 94.9 percent of the state average. Using the multiplicative approach, Calvert County's November wealth measure would fall to 85.3 percent of the state average, resulting in an increase in its state share of funding. Under the current additive approach In Montgomery County, its wealth measure using November NTI is 42.5 percent above the state average. If the State adopted the multiplicative method, Montgomery County's total wealth measure would rise from 144.3 percent of the state average to 197.3 percent of the state average. This change would result in a significant decrease in state aid to Montgomery County and other districts that have incomes above the state average.

Table 7 compares measures of two important equity concepts for the proposed formula if wealth is determined using the multiplicative approach or if it is determined using the additive approach. The first is fiscal neutrality, the measure of the relationship between local wealth and education funding. Ideally, there should be little or no relationship between how wealthy a community is and the amount of money available to fund its schools. The second concept is equity, or how much variation in spending exists

¹⁶ The correlation between per pupil assessable property values and NTI is 0.58. On a per capita basis the correlation is 0.50.

across local jurisdictions. An equitable school finance system should show minimal variation except for spending differences driven by student need.¹⁷

Each of the equity statistics is calculated using two different student counts to examine two different ways of looking at equity. The first, labeled “Unweighted Enrollment,” uses the September 30th enrollment counts. The equity statistics using this count provide a measure of horizontal equity, or how equitable the finance system is without taking student need into account. The second, labeled “Weighted Enrollment” uses the enrollment counts adjusted by the proposed weights for special need students. These statistics provide a measure of vertical equity, or how equitable the system is when accounting for differences in student need.

The table also includes benchmarks, or the generally accepted maximum value for each equity measure. The benchmark for fiscal neutrality should be no more than 0.50. This represents a moderate or lower positive relationship. The benchmark for equity should not exceed 0.10, a fairly low level of variation.

Table 7
Equity Statistics for Multiplicative and Additive Approaches
to Combining Assessed Property Value and NTI

	Benchmark	Multiplicative	Additive
Fiscal Neutrality			
Unweighted Enrollment	0.50	(0.32)	(0.20)
Weighted Enrollment	0.50	(0.19)	0.02
Equity			
Unweighted Enrollment	0.10	0.10	0.09
Weighted Enrollment	0.10	0.10	0.10

The table shows that for all measures both the multiplicative and additive approaches meet or exceed all benchmarks. There is essentially no difference in the equity measure whether using unweighted or weighted enrollment counts. The measure for fiscal neutrality, which would be expected to be impacted the most by a change in the way wealth is calculated, shows that both the additive and multiplicative approaches favor lower wealth jurisdictions (as demonstrated by a negative correlation between wealth and spending in both cases) when using unweighted enrollment counts. This means that the formula provides a somewhat larger state share to lower wealth jurisdictions than a perfectly neutral system. When weighted enrollment is used, the correlation of the additive approach becomes slightly positive (indicating a very small positive relationship between wealth and spending) while the correlation for the

¹⁷ Fiscal neutrality is measured by the correlation coefficient, a statistical measure of the relationship between per student local wealth and per student funding. The correlation coefficient may range from -1.0 (a perfect negative relationship) to 1.0 (a perfect positive relationship). Equity is measured by the coefficient of variation, a statistic that measures the amount of variation around the average for a set of values. The coefficient of variation typically ranges from 0.0 (no variation) to 1.0 (very high variation). An equitable school finance system should show minimal variation except for spending differences driven by student need.

multiplicative approach remains negative. In sum, the multiplicative approach remains somewhat more favorable for lower wealth jurisdictions whether using unweighted or weighted enrollment.

Adopting the multiplicative approach would also result in an increase in the range between the lowest and highest wealth jurisdictions. Under the current additive approach, the range in per pupil wealth between the lowest wealth jurisdiction and highest wealth jurisdiction is \$830,870 per pupil. Under the multiplicative approach this range increases to just over \$1.1 million per pupil.

Adopting a multiplicative approach to combining measures of property wealth and income is not the only way to increase the effect differences in income have on total local wealth. Another alternative is to change the relative weight of the income measure to property wealth. Under the current additive approach in Maryland, NTI comprises 35 percent of total wealth on average. Three of the five other states that incorporate income in their local wealth measure (Massachusetts, New Jersey, and New York) weight income and property wealth so that each comprises 50 percent to the total wealth calculation. The remaining two states, Connecticut and Virginia, place less weight on income. Connecticut weights income as only 10 percent of total local wealth and Virginia weights income as 40 percent of the total. None of these states use the multiplicative approach to combine income and property wealth.

Minimum State Aid Guarantees and Local Shares of Special Needs Programs

Maryland's current funding programs provide minimum state funding guarantees in two ways. First, each district is guaranteed to receive at least 15 percent of its total foundation total program as state aid. Under the minimum foundation aid guarantee, a district with high local wealth may generate the full foundation total program through its local share, but still receive at least 15 percent of the foundation total program in state aid, thus generating additional funding for the district or enabling the jurisdiction to reduce its local share in other program areas.

The second way in which state aid is guaranteed is by guaranteeing that all districts receive at least 40 percent of their special needs total program (compensatory education, LEP, and special education) as state aid. Further, districts are not required to provide a local share for any of these special needs program formulas. Again, under this minimum state aid guarantee, wealthier districts may reduce their local share amounts due to the guaranteed state aid, thereby increasing the cost of the program to the state and reducing or even eliminating any local effort. Further, providing the state aid minimums to wealthier districts and not requiring local shares of the special needs programs may be contributing to inequities identified in the formula in the study team's earlier school funding equity analysis.¹⁸

The study team makes two recommendations concerning these issues. First, the minimum state aid guarantees should be eliminated for foundation and special needs funding programs. Eliminating the state aid minimums will free-up state funding dollars which could be used to provide additional support to those districts with lower local wealth and higher needs. Other states, including Colorado and

¹⁸ See Glenn, W. J., Griffith, M., Picus, L.O., & Odden, A. (2015). *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. Denver, CO: APA Consulting.

Wyoming, take a similar approach. As of fiscal year 2009-10, Colorado eliminated its guarantee for minimum state aid with passage of House Bill 09-1318. Colorado's districts are no longer guaranteed to receive a minimum amount of aid from the state.¹⁹ Wyoming takes a step further than the study team's recommendation; the state does not provide a minimum funding amount, and, when local resources exceed the Foundation Guarantee amount, the excess is recaptured by the state from other aid programs.²⁰

Second, the study team recommends that all districts should be required to appropriate the full local share for all of the special needs funding programs. This change would both improve equity and ensure that districts are receiving the full funding amount identified by the adequacy study.

Under the study team's recommendation, a required local share would be calculated for each special needs (compensatory education, LEP, and special education) program using the same method as the foundation calculation. A total program amount, adjusted by the CWI, would be determined; an equalized local share determined; and a state share equaling the difference between the total program amount and the local share. The local share is equalized using the same method used for calculating the foundation local share; that is, by determining a statewide local contribution rate assuming the state average state and local shares are equal to 50 percent each.²¹ The study team recognizes that this approach differs from the current method of equalization used with the special needs programs, but it elected to use the foundation program's method for two reasons. First, the study team's rationale for requiring a full local share for the special needs funding programs is to ensure that the full adequacy level of funding is provided to all students in every district — students with and without special needs. Second, by making the calculations for the foundation and special needs programs the same, the State could potentially streamline the formula by calculating the total program and state and local shares all within the foundation formula by using weighted student counts, i.e. taking the FTE enrollment count, calculating a weighted count by adjusting for the student need weights, and then multiplying by the foundation amount. A single local contribution rate could then be used to determine the state and local shares.

Under the proposed method of determining state and local shares, the State should also revise its maintenance of effort requirement, which requires each jurisdiction to appropriate the greater of its total foundation local share or its prior year per pupil total local appropriation. Because the proposed total required local share would consist of the foundation, compensatory education, LEP, and special education local shares, the maintenance of effort should be changed to the greater of the proposed total required local share or its prior year per pupil total local appropriation to make it consistent with the changes to the required local share.

¹⁹ See Colorado Department of Education. *Understanding Colorado School Finance and Categorical Funding*. July 2016. <https://www.cde.state.co.us/cdefinance/fy2015-16brochure>

²⁰ See State of Wyoming School Foundation Block Grant Flow Chart. March 2016.

<http://legisweb.state.wy.us/InterimCommittee/2016/SchoolFoundationBlockGrantFlowChart.pdf>

²¹ The formula for determining the local contribution rate is: $(\text{total program} \times 0.50) / \text{total statewide local wealth}$.

Other State Funding Programs and Tax Increment Financing

There are several issues that the study team explored but for which specific recommendations were not provided. These consist of transportation aid, the guaranteed tax base (GTB) state aid program, and tax increment financing. In all three cases, the study team determined there were insufficient research findings or examples of best practices from other states in the literature to support making a recommendation. However, the research team recognizes that these issues should be explored and recommends that the State continue to study these issues and develop recommendations in the future.

Transportation Aid

Transportation aid provides funding for the transportation of general education and disabled students to and from school. The current formula begins with a base amount equal to a district's prior year grant and is then adjusted for inflation and enrollment growth. The study team's recommendations would potentially impact the amount of transportation aid in two ways. First, the study team's recommendation to use the greater of the prior year's FTE enrollment or the average of the three prior years' FTE enrollment will result in higher enrollments in declining enrollment districts, thus providing more aid for these districts and increasing state costs. Second, the State must determine whether prekindergarten students will be transported via district transportation services, and if so, should prekindergarten counts be included in the enrollment counts used to adjust districts' base grant amount. It should be noted that the research team recommended that the transportation aid formula should be thoroughly studied to determine if an updated formula is warranted.²²

Guaranteed Tax Base

The current GTB program was established to incentivize districts with less than 80 percent of the statewide average per pupil wealth to provide a larger local education appropriation. The GTB provides additional state aid for these districts based on two factors: 1) the amount of their local education appropriation in excess of their local foundation share; and 2) the ratio of their wealth per pupil to 80 percent of the statewide average wealth per pupil. Under the current system, the GTB program is an important incentive for jurisdictions to provide a local appropriation for the special needs funding programs. Also, given the current low base funding amount, it aids lower wealth jurisdictions to provide an additional local appropriation to supplement their foundation total program funding. However, under the study team's recommendation that all jurisdictions provide a full local share of the special needs total program amounts, and with a new, adequate base funding amount, the State should examine whether the GTB should be continued in its present form and purpose.

Statutory Inflation Adjustment

In the current education funding formula the per pupil foundation amount is adjusted annually for inflation using the lesser of the Consumer Price Index for the Baltimore-Washington region, the implicit

²² See Hartman, W. & Schoch, R. (2015). *Final Report of the Study of Increasing and Declining Enrollment in Maryland Public Schools*. Denver, CO: APA Consulting.

price deflator for state and local governments, or 5 percent. The study team did not make any specific recommendations for changing or eliminating the current inflation adjustment.

Tax Increment Financing

Tax increment financing (TIF) is an economic development tool that uses the growth in property values in a designated area to pay for some of the costs of redevelopment. For example, the principle and interest of municipal bonds issued to pay for new infrastructure. Because the tax assessments on these properties are used for other purposes, they are not available to support the general operations of local jurisdictions. In Maryland, the growth in property values in designated TIF areas are included in the calculation of property wealth for counties and the City of Baltimore, but these jurisdictions are not able to use the local tax revenues generated by these properties for education funding purposes. In several counties and the City of Baltimore this results in either a loss of education funding or higher tax assessments on other properties. The study team’s analysis of the calculation of local wealth examined this issue and presented an example of how another state has dealt with this issue.²³ However, the study team does not offer a specific recommendation but instead suggests that the State continue to study this issue.

Tables 8 presents a summary of the study team’s recommendations compared to current practice in Maryland.

**Table 8
Summary of Recommendations**

Key Components of Formula	Currently Done in Maryland	Recommendation to Maryland
Student Counts		
Declining Enrollment	Total enrollment is based on the September 30 th FTE enrollment count for the prior school year.	A district would receive the greater of two counts — the prior year’s September 30 th enrollment count or the average of three prior years’ counts.
Counting Low-Income Students	Uses the FRPM eligibility form created by the federal government	Use a FRPM eligibility form that is created by the State and returned to the State
Counting Prekindergarten Students	Prekindergarten students who meet specific qualifying criteria related to the income of a child’s family.	Provide high-quality prekindergarten for up to 80 percent of eligible programs for four-year-old students. In order to receive funding a student must be enrolled in a program that has earned a Level 5 EXCELS rating, has earned state or national accreditation, or is a public school program that reaches EXCELS level 4 standards.
Base Cost	\$6,860	\$10,880 - The recommended base has a greater focus on providing more resources at the base level to all students to meet higher state standards and requirements.
Weights		

²³ See Glenn, W. J., Griffith, M., Picus, L.O., & Odden, A. (2015). *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. Denver, CO: APA Consulting.

Key Components of Formula	Currently Done in Maryland	Recommendation to Maryland
Special Education	0.74	0.91
LEP	0.99	0.35
Compensatory	0.97	0.35
Prekindergarten	N/A	0.29
Regional Cost Adjustment	Uses the GCEI applied only to the foundation amount.	Uses the CWI, includes indices less than 1.0, and is applied to the foundation and all special needs total programs.
Local Wealth		
Net Taxable Income (NTI)	Districts receive the largest amount of state aid that results from using either the September or November NTI.	Recommends that the State only uses the November NTI data for determining local wealth.
Combining Assessed Property Values and NTI	Uses the additive approach by adding together both property and income wealth in its measure of a district's local wealth.	Uses the multiplicative approach. Each district's assessed property wealth is adjusted by multiplying it by the ratio of the district's NTI to that the state average NTI.
Tax Incremental Financing (TIF)	The full value of designated TIF areas is included in the calculation of property wealth of local jurisdictions, but these jurisdictions are not able to use local tax revenue generated by these properties for education funding purposes.	No recommendation
Minimum State Aid Guarantees		
Foundation	Districts are guaranteed to receive at least 15 percent of the foundation total program in state aid.	Should be eliminated
Special Needs Programs	Districts are guaranteed to receive at least 40 percent of their special needs total program as state aid	Should be eliminated
Transportation Aid	Has a base amount equal to a district's prior year grant and is then adjusted for inflation and enrollment growth.	No recommendation
Guaranteed Tax Base	Provides additional state aid for districts based on the amount of their local education appropriation in excess of local foundation share and the ratio of their wealth per pupil to 80 percent of the statewide average wealth per pupil.	No recommendation

Table 9 compares the total of the proposed state and local shares for the foundation, compensatory education, LEP, and special education programs, to the total of the current state share for these programs and jurisdictions' total local appropriation. This is not a perfect apples-to-apples comparison because the proposed local shares do not include any additional local appropriation that jurisdictions may elect to contribute. This comparison shows that total state shares plus local appropriations statewide would increase by 29 percent. Potentially, this increase could be larger if jurisdictions make additional local appropriations above the proposed required local share. The difference between proposed and current ranges from increases of 40 percent or greater in Harford, Prince George's, and St. Mary's counties. Worcester County is the only jurisdiction that would experience a decrease. However, Worcester County currently appropriates a significant amount of additional local funding in addition to

what is required for the foundation local share. If the county continued providing additional local support above the proposed required local share the decrease would be reduced or eliminated.

Table 9
Comparison of Proposed State and Local Shares and the Sum of
Current State Share for Major State Aid Programs and Current Total Local Appropriations
Fiscal Year 2015

Local Unit	Proposed State and Local Shares	Current State Share and Total Local Appropriations ¹	Change	Percent Change
Allegany	\$106,193,944	\$97,205,705	\$8,988,240	9%
Anne Arundel	\$1,161,936,991	\$872,262,781	\$289,674,210	33%
Baltimore City	\$1,449,109,710	\$1,091,079,255	\$358,030,454	33%
Baltimore	\$1,636,358,800	\$1,245,979,562	\$390,379,238	31%
Calvert	\$225,294,976	\$181,704,584	\$43,590,392	24%
Caroline	\$73,873,587	\$57,008,563	\$16,865,024	30%
Carroll	\$338,196,159	\$280,777,814	\$57,418,345	20%
Cecil	\$220,398,254	\$164,695,494	\$55,702,760	34%
Charles	\$370,978,635	\$296,167,005	\$74,811,631	25%
Dorchester	\$63,156,163	\$51,155,643	\$12,000,520	23%
Frederick	\$560,038,906	\$440,349,772	\$119,689,134	27%
Garrett	\$45,089,530	\$42,020,842	\$3,068,687	7%
Harford	\$550,008,571	\$389,381,412	\$160,627,158	41%
Howard	\$766,474,431	\$710,431,292	\$56,043,139	8%
Kent	\$28,665,436	\$24,122,223	\$4,543,213	19%
Montgomery	\$2,467,169,557	\$1,979,122,636	\$488,046,921	25%
Prince George's	\$2,110,671,451	\$1,510,255,217	\$600,416,234	40%
Queen Anne's	\$95,172,967	\$77,598,633	\$17,574,334	23%
St. Mary's	\$252,865,758	\$175,201,983	\$77,663,775	44%
Somerset	\$43,559,075	\$33,971,997	\$9,587,078	28%
Talbot	\$58,485,958	\$45,203,937	\$13,282,021	29%
Washington	\$300,346,598	\$245,648,490	\$54,698,108	22%
Wicomico	\$203,312,762	\$159,344,270	\$43,968,491	28%
Worcester	\$89,045,641	\$89,985,968	(\$940,327)	(1%)
Total State	\$13,216,403,859	\$10,260,675,080	\$2,955,728,780	29%

¹Current state share includes the foundation, compensatory education, LEP, special education, GCEI, guaranteed tax base, supplemental grant, NTI adjustment, and declining enrollment state aid programs. It excludes student transportation grants and the State share of teachers' retirement costs. The current total local appropriation excludes the local appropriation for student transportation.

Table 10 shows the same information as Table 9 but on a per pupil basis. The statewide average increase would be 24 percent on a per pupil basis. The per pupil increase is less than the total dollar increase because the proposed student counts, which now include four-year-olds in the prekindergarten program, are larger. The per pupil differences range from increases of 38 percent in Harford and St. Mary's counties to a decrease of eight percent in Worcester County.

Table 10
Comparison of Proposed Per Pupil State and Local Shares and the Sum of
Current Per Pupil State Share for Major State Aid Programs and Current Total Local Appropriations
Fiscal Year 2015

Local Unit	Proposed	Current ¹	Change	Percent Change
Allegany	\$12,000	\$11,693	\$307	3%
Anne Arundel	\$14,789	\$11,450	\$3,339	29%
Baltimore City	\$17,165	\$13,750	\$3,416	25%
Baltimore	\$15,115	\$11,940	\$3,175	27%
Calvert	\$13,873	\$11,484	\$2,389	21%
Caroline	\$13,339	\$10,890	\$2,450	22%
Carroll	\$12,801	\$10,821	\$1,981	18%
Cecil	\$14,003	\$10,907	\$3,096	28%
Charles	\$14,049	\$11,604	\$2,446	21%
Dorchester	\$13,395	\$11,355	\$2,039	18%
Frederick	\$13,757	\$11,156	\$2,601	23%
Garrett	\$11,434	\$11,100	\$333	3%
Harford	\$14,477	\$10,508	\$3,969	38%
Howard	\$14,397	\$13,760	\$637	5%
Kent	\$13,327	\$12,091	\$1,235	10%
Montgomery	\$16,197	\$13,421	\$2,776	21%
Prince George's	\$16,959	\$12,661	\$4,298	34%
Queen Anne's	\$12,313	\$10,386	\$1,927	19%
St. Mary's	\$14,269	\$10,373	\$3,896	38%
Somerset	\$14,588	\$12,458	\$2,130	17%
Talbot	\$12,650	\$10,516	\$2,134	20%
Washington	\$13,261	\$11,197	\$2,064	18%
Wicomico	\$13,765	\$11,439	\$2,325	20%
Worcester	\$13,239	\$14,400	(\$1,161)	(8%)
Total State	\$15,241	\$12,295	\$2,946	24%

¹Current state share includes the foundation, compensatory education, LEP, special education, GCEI, guaranteed tax base, supplemental grant, NTI adjustment, and declining enrollment state aid programs. It excludes student transportation grants and the State share of teachers' retirement costs. The current total local appropriation excludes the local appropriation for student transportation.

Total Cost of the Recommendations

The study team's adequacy recommendations would result in a significant additional investment in education by the State and some local jurisdictions. The recommendations would also result in some redistribution of resources across districts, even though all districts would experience an increase in funding.

The total state share for major state aid programs, excluding transportation, would increase from \$4.9 billion to \$6.8 billion, an increase of \$1.9 billion or 39 percent over current fiscal year 2015 state aid.²⁴ It is impossible to make an apples-to-apples comparison of current and proposed local shares, since local jurisdictions are not currently required to provide a local share for the special needs aid programs, and many jurisdictions make additional local appropriations beyond what would be required to fund the local share of all of the major aid programs. However, a comparison of the proposed local share for the foundation and special needs programs to the current fiscal year 2015 total local appropriation (excluding transportation) provides a reasonable estimate of the local impact of these recommendations. Using this comparison, the local share would increase from \$5.4 billion to \$6.4 billion, an increase of \$1.0 billion or 19 percent.

Together, again estimating the local share using the local share for all major state aid programs as the proposed local appropriation and the actual current total local appropriation, total funding for all major state aid programs, excluding transportation, would increase from \$10.3 billion currently to \$13.2 billion, an increase of \$2.9 billion or 29 percent.

Comparison to Prior Adequacy Study

Since Maryland conducted a prior adequacy study, the study team has the unique opportunity to be able to compare the total adequacy recommendation not just to current funding but also to the estimates from the earlier work conducted on behalf of the Thornton Commission.

It is important to note what this comparison represents and what it does not represent. The comparison offered here simply examines the total adequacy need level(s) identified in the original work to that of the current study. Comparisons are only of the identified adequacy amounts and do not take into account the actual implementation of the original work. They are meant to examine what the results of the original work would be if adjusted to 2014-15 dollars. To make the base cost figures comparable, the original study figures were adjusted for inflation. The study team used a 1.40 factor to adjust the 2002 report figures to 2014-15 dollars based on the Bureau of Labor Statistics Consumer Price Index for Washington-Baltimore, DC-MD-VA-WV²⁵. The inflation figures used here differ from the method used by the State for the purposes of school funding formulas.²⁶ Total figures used in this section will vary from

²⁴ Fiscal year 2015 is the latest year for which all of the data necessary for making these estimates were available.

²⁵ http://www.bls.gov/regions/mid-atlantic/data/consumerpriceindexhistorical_washingtondc_table.htm

²⁶ The inflation adjustment used by the State in the funding formula is the lesser of the Consumer Price Index for the Baltimore-Washington region, the implicit price deflator for state and local governments, or 5 percent.

those in the previous section as the computations are made at the state level and are not district specific.

The original study used the SSD and PJ approaches to determine adequacy, both of which have been used in the current study. The current work also includes a third approach to determining adequacy: the EB approach. With that in mind, the study team compared the prior study’s SSD results to the current SSD results and the prior study’s PJ results to the current study’s final adequacy recommendations, the blended results of the EB and PJ approaches.

To make this comparison as directly as possible, two assumptions were made. First, for both the original and current study results, the figures used are prior to the federal funds adjustments as the study team feels this is the most direct comparison of the full cost of adequacy from each study. Second, because the SSD approach does not itself generate weights, weights were imputed for the current SSD estimate so that it could be compared to the base and weights of the other approaches. Weights for the current SSD column were calculated by dividing the SSD base into the per pupil resources identified for each special needs category from the current recommendation.

Table 11 below shows the results from this comparison. Again, these figures are the estimates prior to any adjustments for federal funding and are limited to costs generated from applying the base costs and weights to current student counts, so differ from full recommended system estimates in the prior section.

Table 11
Base Costs and Weights for Original and Current Adequacy Studies*

	Original SSD	Current SSD	Original PJ	Current Recommended**
Base Cost	\$5,969	\$8,716	\$6,612	\$10,970
Base Cost Adjusted for Inflation	\$8,362	\$8,716	\$9,263	\$10,970
Compensatory Education Weight	1.10	0.50	1.10	0.40
LEP Weight	1.00	0.50	1.00	0.40
Special Education Weight	1.17	1.39	1.17	1.10

*All base costs and weights are the amounts prior to the adjustments for federal funding.

**The current recommendation is a blended figure from PJ and EB results.

As shown in Table 11 when adjusted for inflation, the original SSD base cost figure is only about \$350 below the SSD base cost figure from the current study. The original PJ base cost figure is more than \$1,700 below the current study’s recommended base cost figure, representing the shift toward more resources at the base level for all students. The weights for the original SSD and PJ studies are much higher than those produced by the current study, with the original compensatory and LEP weights being at least double that of the current weights. Special education weights are more similar between the original studies and current studies.

While the base and weights from the two studies varied, it is also important to consider the overall total costs. Therefore, the study team calculated total cost figures utilizing the inflation adjusted bases and the 2014-15 FTE, compensatory education, LEP, and special education student counts for Maryland. The student counts do not include the increased prekindergarten enrollment discussed in the recommendation section to create a more straightforward comparison. The figures are also prior to any adjustments for regional cost differences such as the GCEI or the CWI that are included as part of the full system comparison in the preceding section.

Table 12 shows the total adequacy cost estimates from the prior adequacy study compared to the current.

Table 12
Total Adequacy Cost Estimates for Original and Current Adequacy Studies (in Millions)

	Original SSD	Current SSD	Original PJ	Current Recommended*
Total Adequacy Cost Estimate	\$11,974.3	\$10,473.8	\$13,264.2	\$12,380.1

*The current recommendation is a blended figure from PJ and EB results.

Overall, the comparison shows that though the results differ between the original and current studies in where resources are focused, low base and high weights versus high base and lower weights, the overall scale of adequacy need is within a comparable range across all four estimates when adjusted for inflation. The original PJ figures provide the highest total adequacy estimate, and the current SSD identifies the lowest total adequacy estimate. Using the original SSD figures and then adjusted annually for inflation from 2002, the target adequacy cost estimate from the prior study in today’s dollars would be very similar to the current recommended total cost of adequacy, about \$400 million apart.²⁷

Summary of Previously Released Reports

The adequacy recommendations detailed above were informed by 13 studies conducted prior to this draft final report. These reports range from research summaries to final impact analyses and provide detailed research methodologies, findings, and recommendations. Specifically, three of the reports focus on school size and two center on enrollment trends and prekindergarten. The remaining studies involve aspects of school finance equity, such as concentrations of poverty and the geographic cost of education. Abstracts and links to PDFs of these reports are provided in Appendix A of *Appendices A-E: Final Report of the Study of Adequacy of funding for Education in Maryland*, a supplemental document to this report. The reports are also available on the Maryland State Department of Education’s adequacy study website at the following link: <http://marylandpublicschools.org/Pages/adequacystudy/index.aspx>.

²⁷ It is interesting to note that the results of the current PJ approach (prior to blending with the EB approach to create the final adequacy study recommendation) would be nearly identical to the original PJ estimate, about \$100 million lower at \$13,152.1 million.

I. Introduction

This *Final Report of the Adequacy of Funding for Education in Maryland* presents the findings of the study team's adequacy analysis for the State of Maryland. Like the original adequacy study conducted for the Commission on Education Finance, Equity and Excellence (Thornton Commission) in 2000 and 2001, this study also made use of multiple approaches to estimating adequacy. Then, through an analysis of the differences in the results of the multiple approaches, the study crafted a single adequacy recommendation for the State. The study team also developed recommendations for a new funding formula incorporating its adequacy recommendation and a model to analyze the impacts of its proposed school funding formula on the State and on individual school districts.

This report is the culmination of two years of work by the study team to estimate the cost of an adequate education in Maryland and to conduct a number of related analyses required in the State's Request for Proposals (RFP). These studies are summarized later in this report.

State Context

There are 879,601 students in grades prekindergarten through 12 enrolled in 24 school districts in the State of Maryland.²⁸ Sixty-one percent of all students are racial or ethnic minorities. The proportion of students receiving specialized services includes 44.6 percent who are low-income as measured by eligibility for the federal free and reduced-price lunch program, 7.9 percent who receive limited English proficiency (LEP)²⁹ services, and 11.3 percent who receive special education services.

Of the State's 24 school districts, 23 are county-based, with the remaining district serving Baltimore City. There is a wide range in district enrollment, ranging from 2,029 students in Kent County to 156,380 in Montgomery County. Six districts enroll more than 50,000 students and three districts enroll more than 100,000 students. All of the districts are fiscally dependent, meaning that they do not raise their own tax aid but rely on local appropriations from the county or city in which they are located.

Maryland adopted new Common Core-based state standards, Maryland's College and Career Ready Standards, effective for the 2012-13 school year, and began administering the Partnership for Assessment of Readiness for College and Careers (PARCC) assessments statewide in the 2014-15 school year. In fiscal year 2015, Maryland spent more than \$5.8 billion on its major state education aid programs,³⁰ while local jurisdictions contributed another \$5.7 billion in local appropriations for

²⁸ Enrollment and demographic information are taken from the 2016 Maryland State Report Card found at: <http://reportcard.msde.maryland.gov/Entity.aspx?WDATA=State>

²⁹ Limited English Proficiency (LEP) students are also commonly referred to as English language learners (ELL). Maryland's funding system refers to these students as LEP students. For the sake of consistency in this report, they will be referred to as LEP students throughout.

³⁰ Total State spending includes the foundation, compensatory education, limited English proficiency, and special education programs; student transportation; guaranteed tax base; net taxable income grants; supplemental grants; declining enrollment grants; and the State share of teachers' retirement costs.

education, totaling \$11.5 billion in state and local support for prekindergarten through grade 12 education.

Study Context

APA carried out a similar adequacy study for the State in 2000 and 2001 under the direction of the Commission on Education Finance, Equity, and Excellence, also known as the Thornton Commission. The 2002 legislation resulting from that study, the Bridge to Excellence in Public Schools Act, significantly increased state support for education and established the school finance formulas that are still used to allocate resources to county boards of education and the Baltimore City Public Schools today. The state aid distributed through these formulas are primarily based on differences in student enrollment, student need, and local wealth. The 2002 Act also required a follow-up study of the adequacy of education funding in the State to be undertaken approximately 10 years after its enactment.

Current School Finance System

The new school funding formula established by the Bridge to Excellence in Public Schools Act retained the foundation-style funding formula previously used by the State but set a level of funding based on adequacy. Foundation formulas set a minimum per student amount of funding, known as the foundation amount, which is multiplied by the count of eligible students to generate a total foundation program funding amount. The foundation amount set by the Act was based on the adequacy recommendations from the Thornton Commission study. The adequacy of the foundation amount was to be maintained by adjusting it for inflation annually. However, recent state budget shortfalls have curtailed the inflationary increases. In fiscal year 2015 the foundation level was set at \$6,860 per student. In addition to an inflation adjustment, the Act also called for the development of a Maryland-specific geographic cost of education index (GCEI) for adjusting the foundation's total program amount to account for regional cost differences. The GCEI adopted by the State in 2005 takes into account regional cost differences in professional district salaries, nonprofessional district salaries, energy, and other instructional costs. As implemented, the index is truncated at 1.0, or the statewide average cost, which provides additional funding for districts in high-cost regions but does not make corresponding reductions for districts in low-cost regions. The additional funding generated by the GCEI consists entirely of state aid.

Like other foundation funding formulas, Maryland's formula also attempts to reduce the amount of disparities in education funding due to differences in local wealth through "wealth equalization." To accomplish wealth equalization, Maryland's foundation formula specifies a uniform local contribution rate that is multiplied by a jurisdiction's local wealth to determine its local share of total program. Jurisdictions with less local wealth, or local appropriation-raising capacity, generate a smaller local share and receive a larger share of total program funding in aid provided by the State. Conversely, jurisdictions with greater wealth generate a larger local share and receive a smaller share of state aid. The local contribution rate is designed so that, on average across all local jurisdictions, state aid comprises half of the total program funding amount. The measure of local wealth that the local contribution rate is applied to consists of the real and personal property assessable value in the jurisdiction, plus its total net taxable income (NTI).

Maryland uses a similar formula for calculating total program funding for three state aid programs used to support students with special needs: 1) the compensatory education program for serving at risk students, 2) the limited English proficiency (LEP) program, and 3) the special education program. The per student program funding amount for these three programs is determined by multiplying the per student foundation amount by a weight to account for the additional costs of educating these students. The program amounts for these three funding programs are also wealth equalized to account for differences in local wealth. Unlike the foundation program, local jurisdictions are not required to appropriate a local share for these three programs.

Table 1.1 shows the student count, base amount, special needs program weights, and per pupil total program amounts for the foundation, compensatory education, LEP, and special education funding formulas. On average across all districts, the State funds 50 percent of these total program amounts, although the percentage in any given district will vary based on the jurisdiction’s local wealth. Local jurisdictions are required to provide a local appropriation for the foundation total program but not for the other total program amounts.

**Table 1.1
FY 2015 Formula Components**

Program	Student Count	Weight	Per Pupil Total Program Amount
Foundation	FTE* Enrollment Grades K-12	N/A	\$6,860
Compensatory Education	Eligible for Federal Free and Reduced- Price Lunch	0.97	\$6,654
Limited English Proficient	Eligible for Program Services	0.99	\$6,791
Special Education	Eligible for Program Services	0.74	\$5,076

*Full-Time Equivalent

A minimum amount of state aid is also guaranteed for each of these programs. The minimum state aid guarantee for the foundation program is 15 percent of the total program. The minimum state aid guarantee for each of the three special needs programs is 40 percent of the state share of funding.

Maryland’s funding system includes several other major funding programs, each of which is listed below:

1. **Guaranteed tax base (GTB).** The GTB provides a financial incentive for jurisdictions with less than 80 percent of the statewide average local wealth per pupil to increase their local education appropriation. These jurisdictions may receive up to 20 percent of the per pupil foundation amount in additional state aid.

2. Net taxable income education grants. When the federal government changed the federal income tax extension filing deadline from August to October, the State conformed to this schedule for state income tax purposes. Beginning in fiscal year 2014, the State began calculating state aid using both the September and November net taxable income totals for local jurisdictions. The State then uses the NTI which produces the largest state aid amount. If the November NTI-based aid amount is larger, districts receive the difference in additional state aid. This increase in state aid was to be phased in over a five-year period.
3. Grants to counties with declining enrollment. Assists smaller districts with declining enrollment by providing a state grant equal to 50 percent of the decrease in state education aid from the prior year. Only two districts meet the grant program's eligibility criteria.
4. Supplemental grants. Beginning in fiscal year 2009, supplemental grants were paid to ensure that all districts received at least a one percent annual increase in state funding following a freeze of the per pupil foundation in fiscal years 2009 and 2010. The grant amounts paid to nine districts were frozen beginning in fiscal year 2011.
5. Student transportation. State aid for student transportation is based on a district's prior year grant with adjustments for inflation and increases in enrollment. Districts are guaranteed a minimum annual increase of one percent.

Approaches to Adequacy

The concept of adequacy as it relates to education funding grew out of the standards-based reform movement (Hamilton, Stecher, & Yuan, 2009). As states implemented specific learning standards and performance expectations for what students should know — along with consequences for districts and schools failing to meet these expectations (and, eventually, federal expectations imposed through No Child Left Behind and continued by the Every Student Succeeds Act) — the focus of school finance shifted to an examination of the resources necessary to provide districts, schools, and students with reasonable opportunities to achieve state standards. Over the past two decades, researchers have developed four approaches to creating estimates for the level of funding necessary to provide all students with the opportunity to receive an adequate education. The study team did not look at transportation, food services and capital when utilizing any of the approaches. The study team believes that transportation is not best funded at a per pupil level. Food services should be self-sustainable through various funding streams. An analysis of capital funding was not included in the scope of this study.

The first three approaches were used by the research team to estimate adequacy in Maryland:

1. The **evidence-based (EB)** approach was developed by Picus, Odden and Associates. The EB approach assumes that information from research can be used to define the resource needs of a prototypical school or district to ensure that the school or district can meet state standards. The approach not only estimates resource levels but also specifies the programs and strategies through which such resources could be used efficiently. The approach is used to identify a base cost figure and adjustments for special needs students.

2. The **professional judgment (PJ)** approach was first used in Wyoming in the mid-1990s and has been one of the most widely used adequacy approaches since then. The PJ approach relies on the experience and expertise of educators in the state to identify the resources needed to ensure that all districts, schools, and students can meet state standards and requirements. Resources include school-level personnel, non-personnel costs, additional supports and services, technology, and district-level resources. The approach identifies both a base cost and adjustments for special needs students.
3. The **successful schools/school district (SSD)** approach was developed by APA. The SSD approach determines an adequate per pupil base cost amount by using the actual expenditure levels of schools or school districts that are currently meeting or exceeding state performance objectives. This approach assumes that every school and school district, in order to be successful, needs the same level of base funding that is available to the most successful schools and districts. The approach does not identify adjustments for special needs students.
4. The fourth approach, the **cost function or statistical (CF)** approach, is an econometric method that estimates the level of funding needed to achieve a given level of student achievement as measured on assessments while controlling for student and district characteristics. The cost function approach was not used because it consists of a district level statistical model that requires a much larger number of districts than the 24 in Maryland to produce reliable results. Also, due to its complexity and use of econometric modeling techniques, the approach has proven difficult to explain in situations other than academic forums.

New Adequacy and Related Studies

In March 2014, the Maryland State Department of Education (MSDE) issued an RFP for the follow-up adequacy study required by the Bridge to Excellence in Public Schools Act. The study was to include, at a minimum, adequacy cost studies that identified a base funding level for students without special needs, 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 was to be based on the requirements of the Maryland College and Career Ready Standards adopted by the State Board of Education.

Augenblick, Palaich and Associates (APA), in partnership with Picus, Odden and Associates (POA) and the Maryland Equity Project (MEP) at the University of Maryland, was selected to conduct the study. The RFP required the consultants to undertake a broad analysis including the following tasks:

- Conduct an adequacy study using at least two approaches;
- calibrate the study to identify the funding required to implement the Maryland College and Career Ready Standards;
- identify a per pupil base level of funding and per pupil weights for students with special needs, such as economically disadvantaged students eligible for the federal free and reduced-price lunch program (FRPM), students with limited English proficiency (LEP) and students eligible for special education services;

- analyze the effects of concentrations of poverty on the adequacy estimates;
- identify gaps in growth and achievement among student groups and make recommendations of programs that might address these gaps;
- find possible relationships between student performance and funding deficits;
- assess the impact of quality prekindergarten on school readiness as a factor in the adequacy estimates;
- make recommendations on any other factors to be included as part of the adequacy study; and
- conduct a review of adequacy studies carried out in other states and report on best practices and recommendations for the Maryland study.

Previously Released Reports

The follow-up adequacy study has been underway since July 2014. Per the requirements of the State's RFP, in addition to estimating new adequacy amounts for base funding and weights for students with special needs, APA's research team also undertook a number of related studies. These studies consisted of:

- A study of the equity of the current school funding system and an evaluation of the method used for determining local wealth;
- a study of optimum school sizes and the factors that drive school size;
- an analysis of alternatives to using federal free and reduced-price lunch counts for determining compensatory aid;
- a study of the impact of changes in enrollment on school district finances;
- an evaluation of the state's geographical cost of education index; and
- an evaluation of the supplemental grants program.

Over the course of this study, the APA study team has worked closely with staff from the Maryland State Department of Education and its partners from the Maryland Department of Budget and Management and the Department of Legislative Services of the State Assembly. The study has also been assisted by an advisory group representing education stakeholders.

To date, the following reports have been released presenting the results and recommendations of the various studies required by the RFP:

1. *A Comprehensive Review of State Adequacy Studies Since 2003* (September 2014).
2. *Summary of School Size Report* (September 2014).
3. *Proposed Methodology for Establishing Adequate Funding Levels in the State of Maryland* (December 2014).
4. *Preliminary Report on the Impact of School Size* (January 2015).
5. *Adequacy Cost Study: An Interim Report on Methodology and Progress* (July 2015).

6. *Evaluation of the Use of Free and Reduced-Price Meal Eligibility as a Proxy for Identifying Economically Disadvantaged Students: Alternative Measures and Recommendations* (July 2015).
7. *Final School Size Study Report: Impact of Smaller Schools* (July 2015).
8. *Final Report of the Study of Increasing and Declining Enrollment in Maryland Public Schools* (November 2015).
9. *Geographic Cost of Education Adjustment for Maryland* (November 2015).
10. *Analysis of School Finance Equity and Local Wealth Measures in Maryland* (December 2015).
11. *The Effects of Concentrations of Poverty on School Performance and School Resource Needs: A Literature Review* (December 2015).
12. *A Comprehensive Analysis of Prekindergarten in Maryland* (January 2016).
13. *A Comparable Wage Index for Maryland* (July 2016).
14. *Adequacy Study: Draft Final Report* (September 2016),

PDFs of these reports may be found on the Maryland State Department of Education's website. The links to these reports are presented in Appendix A. A brief summary of each report is also presented in Chapter V.

Structure of This Report

This report presents both the findings from the adequacy studies undertaken by the study team and makes recommendations for a new funding formula based upon the entirety of work completed. The structure of the remainder of this report is described below.

Approaches to Adequacy

Chapter II through Chapter IV describe the three approaches to estimating an adequate level of education funding for Maryland used by the study team. These consist of: the EB approach, described in Chapter II; the PJ approach, described in Chapter III; and the SSD approach, described in Chapter IV.

Reconciling Approaches to Adequacy

Chapter V details how the study team combined the results of the three approaches to adequacy into a single set of adequacy recommendations, including a base cost and set of weights for specific student groups, including prekindergarten, special education, limited English proficient, and compensatory education students.

Formula Recommendations and Implementation

Chapter VI presents the study team’s full recommendation for a new funding system for the State of Maryland based upon the final adequacy results and the previous studies. It presents a detailed funding formula and an estimate of the results, including district-by-district comparisons with current funding, a comparison to the adequacy study completed in 2002. It also provides considerations for phase-in of adequacy over time.

Additional Studies

Chapter VII of the report presents the finding of five additional studies required by the RFP including:

1. The impact of concentrations of poverty on the study’s adequacy estimates.
2. Determine if a relationship exists between school district spending and performance on state assessments.
3. Analyze whether gaps in growth and achievement among student groups exists and provide recommendations of programs that might address these gaps.
4. The impact of quality prekindergarten on school readiness as a factor in the adequacy estimates.
5. Whether the Supplemental Grant program is still necessary within the context of the new adequacy recommendations.

Appendices

In addition to this report are two volumes of appendices. The first volume, *Appendices A-E to the Final Report of the Study of Adequacy of Funding for Education in Maryland* includes the following:

- A description of and links to previously released reports;
- various materials used with the evidence-based, professional judgment, and successful schools/district approaches to estimating adequacy;
- cost estimates of the major changes to the State’s funding formula; and
- an estimate on the cost of providing high-quality early childhood education to low-income three-year-olds.

The second volume, *Appendix F: Full Report and School Case Studies for the Evidence-Based Approach to Estimating a Base Spending Level and Pupil Weights for Maryland* provides greater detail on the evidence-based model, the individual case study reports for 12 high-performing schools selected for case studies of how resources were used to achieve ambitious student achievement goals, and a cross-case analysis synthesizing the findings from the 12 case studies.

II. Evidenced-Based Approach to Adequacy

The evidence-based (EB) approach to measuring adequacy begins with educational research on student learning and school organization to define the resource needs that would allow a prototypical school or district to meet state standards. The EB approach is unique in that it is derived from research and best practices that identify programs and strategies that increase student learning. Further, the formulas and ratios for school resources originally developed from the research have also been reviewed by dozens of educator panels in multiple states over the past decade and adjusted to meet both the specific state standards and evolving best practices. The EB approach relies on two major types of research:

1. Reviews of research on the student achievement effects of each of the model’s individual major elements, with a focus more recently on randomized controlled trials — the gold standard of evidence on “what works.”
2. Studies of schools and districts that have dramatically improved student performance over a four- to six-year period on state tests.

The EB approach then incorporates these effective practices and strategies into a core EB school improvement model describing the resources needed at the school and district central office levels to help students meet rigorous state standards. This core EB school improvement model is then reviewed by panels of state educators to ensure the recommendations are consistent with both the resources needed to meet the state’s specific standards and requirements, as well as with the state’s educational context.

More details on the research base (including the full bibliography), the components of the EB approach, and the study process that were used to estimate a new base spending level, along with per pupil weights for compensatory education students, LEP students, and special education students, are available in the full EB report in *Appendix F: Full Report and School Case Studies for the Evidence-Based Approach to Estimating a Base Spending Level and Pupil Weights for Maryland*.

The School Improvement Model

The EB approach, also referred to as the core EB model, is a research-based school improvement model shown to boost student achievement. The EB approach not only identifies a base level of staff, dollar resources, and extra resources for students struggling to meet standards, but also outlines how resources can be used to boost student performance. The EB model is structured around 10 improvement strategies. Research suggests district adoption of these strategies leads to significant improvement in academic achievement for all students and substantial reduction in student achievement gaps linked to demographic variables. The 10 school improvement strategies underpinning the approach are:

1. Analyze student data to become deeply knowledgeable about performance issues and to understand the nature of the achievement gap.

2. Set higher goals. These goals may include educating 95 percent of the students in the school to proficiency or higher on state assessments, ensuring that a significant portion of students reach advanced levels of achievement, and making significant progress in closing achievement gaps linked to demographics.
3. Review evidence on good instruction and effective curricula.
4. Invest heavily in teacher training, including intensive summer institutes and longer contract years for teachers.
5. Support students at risk of academic failure by providing some combination of tutoring and other supplemental interventions in one-to-one, one-to-three, or one-to-five tutor-student ratio formats, via the response to intervention (RTI) process. Support for students at risk of academic failure also includes extended-day, summer school, and formal English language development for LEP students.
6. Create smaller classes in early elementary grades, often lowering class sizes to 15 for students in kindergarten through grade three.
7. Restructure the school day to provide more effective ways to deliver instruction.
8. Provide strong leadership support to the principal and to teacher leaders around data-based decision-making and improvements to the instructional program.
9. Foster professional school cultures characterized by ongoing discussions of good instruction and by teachers taking responsibility for, and showing responsiveness to, student performance.
10. Bring external professional knowledge into the school. For example, hire experts to provide training; adopt new, research-based curricula; discuss research on good instruction; and work with regional education service agencies, as well as with the state department of education.

Prototypical School District and Schools

The EB approach develops its estimate for an adequate level of funding by identifying the specific resources needed at the school and district central office levels, and then aggregating these costs to a statewide estimate. To do this, the EB model identifies the types of staff and non-staff resources required for a set of prototypical elementary, middle, and high schools, as well as a district's central office. The EB model uses prototypical district and school sizes from the research literature and the specific state context.³¹ The model can then extrapolate the necessary resources for larger districts and schools from these prototypes by increasing staff and non-staff resources proportionally to the increase in enrollment.

³¹ In other states, the EB model has used prototypical district and school sizes suggested by a review of the research literature. These include a district with an enrollment of 3,900 students, elementary and middle schools of 450 students, and high schools of 600 students.

Due to the large size of the majority of districts in Maryland and the recommendation of Maryland educators who participated in a review of the EB model, the study team used district and school prototypes representative of Maryland's districts. The prototypes used in Maryland consist of a district size of 12,000 students, an elementary school size of 450 students, a middle school size of 720 students, and a high school size of 1,200 students. The larger prototypical school sizes used in this study, however, generally remain within the parameters of research on the most effective school sizes. Adjustments to the core EB model to reflect these larger sizes in Maryland are included in the following recommendations.

Developing an EB School Improvement Model for Maryland

The review of an EB school improvement model suited for Maryland consisted of four steps.

1. The study team prepared a detailed EB report for Maryland, available in Appendix F.
2. In four EB professional judgment (EBPJ) panels, education professionals from across Maryland reviewed the core EB model and provided feedback on necessary changes to ensure adequacy in the State of Maryland. The EB recommendations, summarized below, include changes to the EB model recommended by the four panels.
3. Through case studies of 12 high-performing schools, the study team identified the strategies currently used in successful and, when possible, improving, schools in Maryland. The case studies provided information on multiple aspects of the improvement strategies in each of these schools and collected details about specific school resources, including class size, number of electives, and amount of pupil support resources.
4. The study team revised and modified the core EB model based on the EBPJ panels and case study schools.

Reviewing the Core EB Model

Once the core EB model was created, based on findings from the research literature, the study team revised it to reflect Maryland's specific state standards and context. This review consisted of three steps:

1. The state's education requirements and standards were reviewed to determine whether they required changes in the core EB formulas.
2. Education professionals from across Maryland reviewed the core EB model. Specifically, the study team created four EBPJ panels to review the EB model's components and provide feedback on any changes necessary to ensure adequacy in the State of Maryland. The EB recommendations summarized above include suggested changes from the four panels.
3. The study team identified the strategies currently used in successful and, when possible, improving schools in Maryland by conducting daylong case studies in 12 schools. The case studies provided information on multiple aspects of the improvement strategies in each of these

schools and collected details about specific school resources, including class size, number of electives, and amount of pupil support resources.

The core model was then modified based on what was learned from the input of the EBPJ panels and case study schools.

EB Professional Judgment Panels

In June 2015, the study team convened four EBPJ panels across the State to review the EB core model from a Maryland perspective. The purpose of these panels was threefold:

- To share the elements of the EB model with panel members;
- to ask the panel members to reflect on those elements; and
- to provide the research team with Maryland-specific insights on how each of the elements will operate within the State.

Based on the feedback from these EBPJ panels, the EB model was adjusted to reflect Maryland’s unique circumstances.

For each panel, nearly half of the participants were teachers. The study team sought to identify teachers who are recognized as being among the best in their schools. Where possible, teacher participants were selected from a list of master teachers previously vetted by MSDE. Other panel participants consisted of school board members, district and school administrators, and instructional coaches recommended by their districts. Appendix B contains details on the number and types of participants serving on each of the four panels.

The four EBPJ panel meetings included one panel meeting on the Eastern Shore, one in western Maryland, one in northern Maryland, and one in southern Maryland. Table 2.1, below, provides the dates and regions of the panels.

Table 2.1
EBPJ Panel Dates

Date	Region
June 23, 2015	Eastern Shore
	Western Maryland
June 24, 2015	Northern Maryland
	Southern Maryland

Panelists were not compensated for their participation, though meals were provided and some expenses, like mileage and parking fees, were reimbursed.

At each meeting, members of the research team described the overall EB approach and the school improvement model that is the basis of the EB conceptual model. Next, members of the research team presented each component of the model to the panel. The research team next sought input as to whether the identified resources are sufficient to meet the needs of school districts in the area. The

research team also asked for recommendations (and the rationale behind those recommendations) for alternative approaches. These alternative approaches were reviewed, and if supported by research evidence, incorporated in the EB model.

EB Model Resources

Table 2.2 shows the resources recommended by the EB model based on Maryland-specific input from the EBPJ panels and case study schools. The EB model presents the research-based staff and non-staff resource recommendations for the following areas:

- **Staffing for core programs**, which include full-day prekindergarten, full-day kindergarten, core teachers, elective/specialist teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses (the latter three constituting recent changes and additions to the EB model), substitute teachers, supervisory aides, librarians, principals/assistant principals, and school secretaries;
- **dollar per student resources**, including gifted and talented, professional development, computers and other technology, instructional materials and supplies, short-cycle assessments, and extra duty/student activities;
- **central office functions** including maintenance and operations, and central administration; and
- **resources for students at risk of academic failure** including tutors, additional pupil support, extended-day, summer school, LEP programs, alternative schools, and special education.

The design of the EB model reflects the Response to Intervention RTI model, a three-tier approach to meeting student needs. Tier 1 refers to core instruction for all students. At the Tier 1 level, the research behind the EB model suggests making core instruction as effective as possible with modest class sizes, provisions for collaborative time, and robust professional development resources. Effective core instruction is the foundation on which all other educational strategies depend. Tier 2 services are provided to struggling students (generally indicated by FRPM pupil counts) to help them meet standards without being given an individualized education program (IEP) and moved into special education. The EB model's current Tier 2 resources include one core tutor for every prototypical school and additional resources triggered by FRPM and LEP student counts, providing funding for tutoring, extended-day, summer school, additional pupil support, and LEP services. Tier 3 includes all special education services.

For the core EB model, at risk students is the non-duplicated count of FRPM and LEP students, which includes both all FRPM students and all non-FRPM LEP students. LEP students includes all LEP students, whether or not they are eligible for FRPM.

Table 2.2
Summary of Current Evidence-Based Model Recommendations

Evidence-Based Model Element	Current Evidence-Based Formula Ratio or Dollar Per Pupil Figure
Staff Resources For Core Programs	
1a. Full-day prekindergarten	Each three and four-year-old prekindergarten classroom is staffed at a class size of one teacher and one aide for every 15 students
1b. Full-day kindergarten	Full-day kindergarten program; each kindergarten student counts as 1.0 pupil in the funding system
2. Core elementary class sizes/core teachers	Kindergarten through grade three: 15 Grades four through five: 25
3. Secondary class sizes/ teachers	Grades six through 12: 25 (plus one additional teacher per 600 students in high schools to support smaller advanced level courses)
4. Elective teachers	Elementary Schools: 20 percent of core elementary teachers Middle Schools: 20 percent of core middle school teachers High Schools: 33½ percent of core high school teachers
5. Instructional Coaches	One instructional coach position for every 200 students
6. Core Tutors	One tutor position for every 450 elementary and middle school students and for every 600 high school students (additional tutors are enabled through the at risk pupil count in Element 22)
7. Substitute Teachers	Five percent of core and elective teachers, instructional coaches, tutors (and teacher positions for additional tutoring, extended-day, summer school, LEP, and special education programs)
8. Core Guidance Counselors and Nurses	One guidance counselor for every 450 grade K–5 students One guidance counselor for every 250 grade 6–12 students One nurse for every 750 K–12 students (Additional student support resources are provided on the basis of at risk student counts in Element 23)
9. Supervisory Aides	One supervisory aide for every 225 elementary and middle school students, one supervisory aide for every 200 high school students
10. Library/Media Specialists	One library/media specialist position for every 450 elementary and middle school students and for every 600 high school students
11. Principal/Assistant Principal	One principal for the 450 student prototypical elementary school One principal and one assistant principal for the 720 student prototypical middle school One principal and three assistant principals for the 1,200 student prototypical high school
12. School Site Secretarial Staff	One secretary position for every 225 elementary and middle school students, and for every 200 high school students

Evidence-Based Model Element Dollar Per Student Resources	Current Evidence-Based Formula Ratio or Dollar Per Pupil Figure
13. Gifted and Talented	\$40 per pupil
14. Professional Development (PD)	10 days of student-free time for training built into teacher contract year \$125 per pupil for trainers (In addition, PD resources include instructional coaches [Element 5] and time for collaborative work [Element 4].)
15. Instructional Materials	\$190 per pupil for instructional and library materials
16. Short-Cycle/Interim Assessments	\$25 per pupil for short-cycle, interim and formative assessments
17. Computer Technology and Equipment³²	\$250 per pupil for school computer and technology equipment
18. Career Technical Education (CTE) Equipment	\$10,000 per CTE teacher for specialized equipment
19. Extra Duty Funds and Student Activities	\$250 per student for co-curricular activities including sports and clubs for grades K–12 (funding not provided for prekindergarten)
Central Office Functions	
20. Maintenance and Operations	Separate computations for custodians, maintenance workers and groundskeepers, including \$305 per pupil for miscellaneous supplies
21. Central Office Staffing	Using a 12,000 student prototypical district, a dollar per student figure for the Central office based on the number of full-time equivalent (FTE) positions generated and the salary and benefit levels for those positions; it also includes \$300 per pupil for miscellaneous items such as Board support, insurance, legal services, etc. Specific resource allocations for district central office staff are provided below in Table 2.2.
Resources for Special Needs Students	
22. Tutors	One tutor position for every 125 at risk students (in addition to the core tutor positions in each prototypical school [Element 6]); these positions are provided additional days for PD (Element 14) and substitute days (Element 7)
23. Additional Pupil Support	One pupil support position for every 125 at risk students; these positions are provided additional days for PD (Element 14)
24. Extended-Day	One teacher position for every 30 at risk students or 3½ full-time equivalent (FTE) teacher positions per 100 such students; position paid at the rate of 25 percent of annual salary, enough to pay a teacher for a two-hour extended-day program, five days per week. (This formula equates to one teacher position for every 120 at risk students)

³² Infusing technology into the school curriculum has associated costs for computer hardware, networking equipment, software, training, and personnel associated with maintaining and repairing these machines. The total cost is made up of 1) Direct costs: hardware, software, and labor cost for repairing and maintaining the machine and 2) Indirect costs: time spent in training classes, casual learning, trainers, self-support, and downtime costs.

Evidence-Based Model Element	Current Evidence-Based Formula Ratio or Dollar Per Pupil Figure
25. Summer School	One teacher position for every 30 at risk students or 3¼ FTE per 100 such students; position paid at the rate of 25 percent of annual salary — enough to pay a teacher for a six- to eight-week, four-hour per day summer school program and include adequate time for planning and grading. (This formula equates to one teacher position for every 120 at risk students)
26. LEP Students	One teacher position for every 100 identified LEP students (This provision is in addition to all the resources triggered by the at risk student count, which includes all LEP students)
27. Alternative Schools	One assistant principal position plus one teacher position for every seven alternative learning education (ALE) students
28. Special Education	One teacher position for every 150 students in the school One aide position for every 150 students in the school Deduction of federal Title VI, Part B funds Full state funding for students with severe disabilities, minus the cost of the basic education program for all nonpublic placements

Detailed discussions of the research base for each recommendation in this table are in Appendix F.

Table 2.3 summarizes these staffing proposals, organized into departments into which a central office could be organized, and provides additional detail on the staffing resources allocated to a prototypical school district with 12,000 students. For districts with fewer or more students, the staff recommendations would be prorated accordingly.

Table 2.3
Evidence-Based Central Office Staffing for District with 12,000 Students

Office and Position	EB PJ Panel Modified	
	Modified Evidence-Based Administrator	Modified Evidence-Based Model Classified
Superintendent’s Office		
Superintendent	1	
Secretary/Receptionist		1
Clerk		1
Curriculum and Instruction/Education Services		
Assistant Superintendent	1	
Director of Elementary and Secondary	1	
Director of LEP	1	
Director of Assessment and Accountability	1	
Clerk		2
Secretary		4
Instructional Technology and Technology Network and Support		
Director	1	
Assistant Director	1	
Network Supervisor	1	
Systems Supervisor	1	
Technician	10	

Office and Position	EB PJ Panel Modified	
	Modified Evidence-Based Model Administrator	Classified
Secretary		2
Clerk		2
Human Resources/Personnel		
Assistant Superintendent	1	
Director	1	
Credential Specialist		1
Personnel Technician		2
Secretary		2
Special Education		
Assistant Superintendent	1	
Director	1	
Program Specialists	4	
Secretary		2
Clerk		2
Business Office		
Assistant Superintendent	1	
Director of Fiscal Services	1	
Accounting Technician		3
Risk Manager	1	
Benefit Technician		1
Director of Purchasing	1	
Buyers		2
Payroll Supervisor	1	
Payroll/purchasing Clerks		2
Records Technician		1
Warehouse Manager	1	
Warehouse Workers		2
Director Maintenance and Operations (M and O)	1	
Assistant M and O Director	1	
Supervisor M and O	2	
Clerk		3
Secretary		5
Student Services		
Director	1	
Coordinator Health Services	1	
Secretary		1
Clerk		1
Coordinator Health Services	1	
Secretary		1
Clerk		
Total Central Office Staffing (12,000 Students)	40	43

Changes Made to the EB Model Based on the EBPJ Panel Review

The case studies and the EBPJ panels informed changes that needed to be made to the EB model to fit the needs of Maryland's students. Specifically, the EBPJ panel recommendations fell into three categories:

1. Areas where the panelists recommended changes with a sound research basis or modifications necessary to meet state requirements. These changes have been incorporated into the EB model.
2. Areas where panelists recommended changes or identified potential concerns with the EB model but were not changed in the EB model.
3. Areas where panelists were in general agreement with the EB model recommendations.

The study team's response to the recommendations made in categories 1 and 2 are described below, identifying the EB model elements from Table 2.2 in each section.

Areas Where the Evidence-Based Model Was Changed

There were four areas where EBPJ panel recommendations suggested strong evidence for modifying the original EB model. These include 1) prototypical school sizes; 2) additional teacher positions at the prototypical size high school to allow for smaller advanced classes; 3) changes to the description of LEP resources; and 4) adjustments to the central office staffing recommendations to address concerns about district size and services for special education students. Each area is described below.

Prototypical School Sizes

The EBPJ panels suggested that the prototypical middle and high schools were much smaller than most schools in the State. As a result, the study team changed the sizes to 720 students for the prototypical middle school and 1,200 students for high school. These sizes are still generally within the parameters research suggests for effective middle and high schools.

Core High School Teachers (Element 3)

The number of core high school teachers is important to providing smaller class sizes. Participants at the EBPJ meetings generally supported the EB class size recommendations and stated that the class size of 25 was generally lower than most districts are now able to provide. However, the panelists expressed concerns about schools' capacities to offer smaller sizes for advanced classes and a diversity of CTE courses, including advanced CTE courses. This was a particular concern for high school math. A new state requirement mandates all high school students take four years of math. For students who take algebra in junior high, it is likely that by the end of grade 11 they will have taken the standard high school math curriculum and precalculus and there will be a need to offer more advanced classes, most of which are likely to have relatively low enrollments.

To accommodate this need in high schools, the study team assumed about 10 percent of juniors and seniors would require these advanced, smaller classes. This would amount to 60 students in a

prototypical school of 1,200 students (300 per grades nine through 12). Adding two teachers would allow these 60 students to enroll in 10 advanced classes as small as six students. Since most of these advanced classes could be larger than six, there is room for these students to take multiple advanced classes and maintain their small sizes. Moreover, since these students are not enrolled in other regular courses when they are in the advanced classes, there is some additional flexibility of class size in the nonadvanced courses. Two additional teachers in the prototypical high school of 1,200 students would be sufficient for high schools to provide advanced courses in line with state advanced math requirements.

Therefore, for a prototypical high school of 1,200 students, the Maryland EB model includes two additional core teachers to provide resources to offer these smaller, advanced classes. In addition, since this core teacher would also generate elective teacher resources, there would be another 33⅓ percent FTE elective teacher in the school. The study team's model adds one advanced course teacher for every 600 students in high schools.

Limited English Proficient Students (Element 26)

As part of the strategies for helping students at risk of academic failure, panelists expressed concern about the EB model's approach for serving LEP students. Many panelists were confused about the EB model's definition of at risk students, which is the unduplicated count of FRPM and LEP students. This led panelists to report that the resources for LEP students of one teacher per 100 LEP students were too low, generally not realizing that the inclusion of LEP students in the at risk student count also provides them with tutoring, extended-day, summer school, and additional support resources.

At the recommendation of one of the panelists, the study team modified the manner in which the EB model provides extra help resources to make more explicit the level of resources provided to LEP students.³³ The amount of these resources remains the same in the model. For example, in a district with 75 LEP students, 40 of whom are FRPM eligible, and 100 FRPM students, 40 LEP and 60 non-LEP, the 75 LEP students would receive all of the extra help services provided through the EB model plus one LEP teacher for every 100 LEP students. The remaining 60 FRPM students would receive all of the extra help services but not the LEP staffing.

In conclusion, the EB model has been modified to make the distinction between the LEP (FRPM and non-FRPM) and FRPM students more transparent so that the resources directed toward each group are clearer.

Central Office (Element 21)

There was a modest amount of discussion of the central office function at the EBPJ panels. The main concern expressed was the small size of the 3,900 student EB prototype district used to develop central office resources. In response, the study team independently contracted with a group of three former

³³ The at risk count is now non-LEP FRPM students and the LEP count now includes all LEP students (FRPM and non-FRPM). As a result, LEP students in the EB model now receive all of the at risk services for teacher tutors, pupil support, extended-day, and summer school, as well as the one additional teacher per 100 LEP students. The remaining FRPM students receive all of the at risk resources, but not the additional LEP teaching support. This change only affects the description of how extra help resources are provided to FRPM and LEP students.

school superintendents with experience in varying size districts from a range of states. These superintendents provided central office staffing configurations at a range of district sizes and pointed out that above 12,000 students, central office staff can be prorated up uniformly.

Table 2.3 above summarizes the central office staffing for the 12,000 student district. The study team used this model to estimate the per pupil central office costs included in the EB base program cost estimate.

Areas Where EBPJ Panels' Recommended Changes Were Not Included in the Adjusted Evidence-Based Model

There are seven elements of the EB model where the EBJP panels offered important suggestions. The study team describes those recommendations here but has not modified the core EB model to reflect these changes for reasons that are discussed below. It is the theory of action of the EB approach unless there is evidence supporting the recommendation, the recommendation is not modified. The seven elements are:

- Prekindergarten;
- core elementary teachers;
- elective teachers;
- guidance counselors and nurses;
- principals and assistant principals;
- special education; and
- alternative schools.

Prekindergarten (Element 1a)

The EB model resources prekindergarten programs as full-day programs for three- and four-year-old children with one teacher and one aide for every 15 students, along with many of the other resources in the model. The EBPJ panels supported this recommendation but offered two suggestions:

1. Several panelists noted there are students who enroll in kindergarten with major behavioral and social issues that could be ameliorated if they had attended a prekindergarten program the year prior. This suggestion does not change the EB model recommendations, but it does offer another argument in favor of prekindergarten programs.
2. A number of panelists wondered whether current schools had the space for such an expanded prekindergarten program and suggested that perhaps a capital construction allocation could accompany implementation of this expansion of prekindergarten. They pointed to the capital funding efforts that followed the phase-in of the Thornton Commission recommendation to expand kindergarten from half to full day as an example of what might be needed. This is a critical concern, but capital construction is not a direct component of the EB model. Prior to undertaking a large capital construction program, the State would want to consider what school space is currently available and alternative prekindergarten school locations.

In the case of prekindergarten, the discussions centered around expansion and access to prekindergarten. These suggestions reflected the real needs of children and schools in Maryland but do not offer specific changes that could be made to the current EB model, and therefore, the changes were not incorporated.

Core Elementary Teachers (Element 2)

The EB model provides core elementary teachers at a ratio of 15 students per teacher in prekindergarten through grade three and 25 students per teacher in grades four through five. This is an average of 17.3 students per core teacher. The EBPJ panels supported this recommendation, although a small number of panelists argued that kindergarten classes needed an aide. This view was not represented across panels or even a consensus in the panel where it was discussed so the change was not made to the model. Panelists also asked if there is sufficient classroom space to meet these class size ratios and discussed the issues of capital construction as described in the similar discussion about prekindergarten capital expansion (Element 1a above).

Elective Teachers (Element 4)

The EB model provides elective teachers to prototypical schools at a rate of 20 percent of elementary and middle school core teachers and 33⅓ percent of core high school teachers. The issue of elective teachers speaks to a number of important issues: (1) elective courses (i.e. art, music, and physical education, which are part of the EB model); (2) the school schedule; and (3) a schedule that allows sufficient time for collaborative team training and planning. In high schools, this allocation allows a block schedule with four 90-minute blocks each day, so teachers teach during three blocks and have 90 minutes, or 25 percent, of each day for individual and collaborative planning. This planning period also could be organized as two 45-minute periods.

Panelists felt that the model for elementary and middle school teachers was insufficient for both individual planning and collaborative team work (although this allocation was more than the three weekly time blocks of student-free time currently provided to most elementary teachers). Panelists offered two potential suggestions:

1. The model should provide 33⅓ percent electives for both elementary and middle schools, the same as for high school.
2. Alternatively, middle schools should be organized into a seven-period schedule with teachers providing instruction for five periods, requiring elective teachers to be 40 percent of core teachers.

Both suggestions would increase model costs or reduce core instructional minutes, so the study team deferred to available research and did not include either in the model.

Guidance Counselors and Nurses (Element 8)

The EB model provides for one guidance counselor for every 450 kindergarten through grade five students and one for every 250 grade six through 12 students, as well as one nurse for every 750 students. The EBPJ panels supported this recommendation, although a number of panelists suggested

that each school should have a full-time nurse or nurse assistant to administer student medications and address other health issues that arise during the school day. The panelists' concern related to what happens if a child becomes sick or is hurt while the nurse is at another location. As available research does not support this recommendation, the study team did not change the model in this area.

Principals and Assistant Principals (Element 11)

The EB model provides one principal for the 450 student elementary school, one principal and one assistant principal for the 720 student middle school, and one principal and three assistant principals for the 1,200 student prototypical high school.

The EBPJ panels strongly recommended that all prototypical sized elementary and middle schools have an additional assistant principal. Panelists argued:

- Current Maryland practice calls for more administrators in schools than the EB model provides;
- there has been a substantial burden on school site administrators due to the multiple observations required by the new teacher evaluations as well as the time required to work and consult with teachers on student learning objectives that are part of the new teacher evaluation systems;
- the need to coordinate testing (some panelists argued for testing coordinators for this work at each school); and
- administrative demands of coordinating IEP development and paperwork.

These arguments led to recommendations that a prototypical high school would need two assistant principals and that high schools in high-poverty areas may need even more school site administrators.

While the study team did not incorporate the full recommendation, as available research did not provide sufficient evidence to do so, it did modify the assistant principal allocation to reflect the larger prototypical middle and high schools. Specifically, the Maryland EB model includes one principal and one assistant principal for the prototypical 720 student middle school and one principal and three assistant principals for the prototypical 1,200 student high school.

Alternative Schools (Element 27)

Generally, EBPJ panelists felt that the EB model staffing provision of the equivalent of one assistant principal and one full-time teacher or educational professional for every seven students in an alternative school would work well for typical alternative schools with between 35 and 75 students. This was particularly true if alternative school students were defined as children with multiple behavioral and emotional issues, including substance abuse.

However, further discussion by the EBPJ panels led to concerns about additional student needs and several suggestions for enhancing the resources available to alternative schools.

Although the study team does not offer a recommendation to enhance resources for alternative schools, given available research, the team reports the findings from the EBPJ panels for consideration by Maryland policy makers:

- One district argued that some students in alternative schools required more intensive assistance as they had been convicted of serious felonies and violent crimes and were dangerous to other students;
- another district argued that many alternative schools might be needed to serve different regions of larger school districts and that each school would need a principal, an assistant principal, several counselors, and perhaps mental health professionals;
- some panelists suggested that alternative schools should be provided for middle schools as well, and a few even argued for alternative elementary schools, especially for children who currently enter kindergarten without the benefit of a prekindergarten program. Several panels raised the issue that students in kindergarten who had not had a schooling experience before enrolling might need intensive emotional and behavioral attention for the first quarter of the year and that a prekindergarten program would alleviate this need;
- representatives from several districts suggested creating a categorical program for a Welcome Center for new immigrants, particularly new immigrants from backgrounds that could include refugee camps and no previous schooling experience; and
- finally, one individual cautioned about separating alternative school sites from regular high schools, arguing that if alternative school students were primarily minorities, further separation risked civil rights violations.

Special Education (Element 28)

The EB model provides one teacher position and one aide position for every 150 students in a school (total students, not special education students). In addition, it suggests funding should be net of federal Title VI-B funding and that the State should fully fund the costs of programs for students with severe disabilities.

The EBPJ panel discussions about special education were closely linked to the discussion of strategies for students at risk of academic failure. The research behind the EB model shows that as more preventative resources are provided for Tier 2 interventions (tutoring, extended-day, summer, and extra pupil support), the need for special education services is reduced. As a result, the EB model puts more resources into these Tier 2 strategies and less into special education.

A number of panelists observed that the EB allocation of one teacher and one aide for every 150 students would result in fewer special educators than are currently employed in Maryland schools. While the EB model provides extra resources for assistance than are currently provided, including additional Tier 2 resources to reduce the need for special education, panelists had difficulty conceptualizing this shift. This led to concerns among some panelists that the census-based special education model is insufficient to meet special education demands and expectations. Others seemed to feel that the allocation in the EB model would be sufficient.

Several principals suggested that if their school received the extra help resources *and* the special education resources identified in the model, they would hire teachers with special education certification to fill some of the extra help positions and organize around student needs. As a result, they felt the overall allocation of teacher resources to the school site was sufficient.

Some of the EBPJ panelists, as well as some of the people interviewed for the case studies, asserted that effective use of more preventative Tier 2 programs, along with early intervention supports embedded in the EB model (prekindergarten, smaller kindergarten through grade three classes, multiple Tier 2 interventions including tutoring), had reduced the need for special education in their schools. This perspective aligns with the theory of action embedded in the EB model and drives the logic behind resource allocation in the model. This leads the study team to reaffirm its recommendation of one teacher and one aide for every 150 students.

The EBPJ panels supported the concept of full state funding of programs for students with severe and profound disabilities and argued it would be important for the State to develop rules and regulations to identify these students and programs. Therefore, the EB model includes a weight for students with mild and moderate disabilities and assumes the state will fully fund students with severe disabilities.

The one other special education issue that emerged from the EBPJ panels was the need for related services, including occupational therapy, physical therapy, speech/language, hearing, emotional support for children experiencing trauma, and mental health services. The study team's updated central office model accommodates support for staff to meet these needs.

Case Studies of Improving Schools

Between October 2014 and March 2015, the study team, together with the Maryland Equity Project (MEP), conducted 12 case studies of high-performing and improving schools in Maryland. The studies investigated the programs and strategies effective in raising the achievement levels of all students, especially students from poverty, minority, and non-English speaking backgrounds. One goal of the case studies was to see if the school improvement strategies in Maryland differed from the EB model and required changes or augmentation of the model.

The 12 case study schools were selected on the basis of their performance on Maryland state assessments. For elementary and middle schools, performance data were taken from Maryland State Assessment (MSA). For high schools, achievement data were taken from Maryland High School Assessment (HSA) tests. The primary metric used was the percentage of students who scored proficient or advanced in each school. These assessment data were used to select schools in four performance categories:

1. **High Performing:** these are schools with a very high percentage of students achieving at the proficient or advanced levels. Specifically, to be selected in this category, at least 90 percent of all students in a school had to achieve proficient or better over a six-year period.

2. **High Growth:** schools selected in this category had to achieve at least 50 percent growth over the six-year period. That is, the percentage of students scoring proficient or advanced on the test had to increase by at least 50 percent between the first year and the sixth (for example, from 50 percent to 75 percent). These schools were also required to have at least 60 percent of all students achieving proficient or above in the most recent year of data used.
3. **Reducing the Poverty Gap:** selected schools were successful in significantly reducing the achievement gap between low-income students, those identified as FRPM eligible, and all students in the school.³⁴ The research team used a benchmark of a two standard deviation decrease in the achievement gap (approximately 14 percentage points) over six years. These schools were also required to have at least 60 percent of all students achieving proficient or above in the most recent year of data used.
4. **High Growth for Student Groups:** schools in this category were selected on the basis of how well they had improved achievement for ethnic/minority, FRPM, LEP, and special education students. The specific criteria for selecting these schools were at least 50 percent growth for at least two of the subgroups. These schools were also required to have at least 60 percent of all students achieving proficient or above in the most recent year of data used.

Table 2.4 provides a summary of the 12 schools' demographic characteristics. The percentage of students eligible for FRPM ranged from 40 to 85 percent, with seven schools having a rate above 50 percent. The minority percentage (non-white) ranged from three to 98 percent, with nine schools above 50 percent and six schools above 80 percent. The percentage of LEP students ranged from 10 to 32 percent, with four schools having fewer than five LEP students. Special education rates ranged from six to 18 percent for 11 of the schools. One school with several programs for students with disabilities had a rate of 32 percent. It is important to note that more than half of the case study schools are smaller than the prototype schools described in the EB approach.

³⁴ Because the available data were not at the student level, the study team could not make comparisons between FRPM and non-FRPM students.

Table 2.4
Characteristics of Case Study Schools

School (County)	Enrollment	FRPM	LEP	Minority	Special Education	Performance Category
Chillum Elementary (Prince George's)	274	85%	32%	97%	6%	High-Growth
Parkland Middle (Montgomery)	883	52%	10%	87%	10%	High-Growth
Somerset Intermediate (Somerset)	409	76%	<=5	56%	18%	High-Growth
Bel Air Elementary (Allegany)	216	48%	<=5	3%	16.7%	High-Performing
Chadwick Elementary (Baltimore County)	548	81%	21%	98%	9%	High-Performing
North Hagerstown High (Washington)	1,280	49%	<=5	41%	10%	High-Performing
James H. Harrison Elementary (Prince George's)	330	70%	16%	94%	32%	High-Growth for Student Groups
Patterson Park Public Charter ³⁵ (Baltimore City)	670	80%	18%	87%	12%	High-Growth for Student Groups
Wiley H. Bates Middle (Anne Arundel)	800	46%	10%	53%	9%	High-Growth for Student Groups
Fairmont Heights High (Prince George's)	837	65%	<=5	97%	16%	High-Growth for Student Groups
North Frederick Elementary (Frederick)	590	47%	14%	41%	6%	Reducing the Poverty Gap
Redland Middle (Montgomery)	545	40%	11%	67%	11%	Reducing the Poverty Gap

The school site visits consisted of multiple interviews with individual school administrators and teachers or with small teacher focus groups. An interview with the principal was typically scheduled during the first 90 minutes of each visit. This was followed by interviews with lead teachers; classroom teachers emphasizing math, reading/English/language arts/writing, and science; instructional coaches; and other key staff providing instruction in special education, Tier 2 interventions, and LEP. Teacher interviews were conducted during their student-free periods. The actual types and numbers of teachers interviewed and the length of interviews varied by school and each school's schedule.

³⁵ Serves a prekindergarten through grade 8 grade span

Following each site visit, the case researchers drafted a case study report summarizing the information learned from the document review and site interviews. The case study reports included common information:

- School demographics;
- school achievement data;
- school staffing;
- curriculum and instructional program, focusing on reading, mathematics, and if possible science, and including organization of teachers into collaborative groups (if done by the school), use of instructional coaches, and nature of data-based decision making;
- interventions for students struggling to achieve to standards;
- short-cycle assessments;
- PD; and
- school culture.

Cross-Case Analysis

The study team then conducted a cross-case analysis, designed to identify common themes and findings across the 12 school sites. Each case study provides Maryland educators with information about successful strategies schools are using to boost student performance, reduce gaps in performance between and among various subgroups of students, and to maintain high performance levels. The focus of the cross-case analysis is on the resource needs in support of implementing the following strategies in these 12 schools:

- Staffing and class size;
- collaborative learning teams;
- interim, short-cycle assessments;
- extra help for students at risk of academic failure; and
- alignment with the elements of the EB model.

Case Study Findings

The case study findings emphasized strategies that impacted student performance in the core subjects of reading/English/language arts and mathematics, and in a few cases, science. Thus, the cases did not address other potentially important outcomes, the causes of those outcomes, or the resources and specific staffing needs associated with those outcomes. This cross-case analysis summarizes many of the strategies involved in producing results for the core subjects listed.

Nearly all schools had specific goals focused on improving student performance in reading and math. Several schools specifically had goals to reduce achievement gaps linked to student demographics. The goals helped schools set their priorities for time and resources, and provided guidance for where the schools' staff should focus their efforts.

Most schools were in the process of adopting new instructional materials in both reading and mathematics, largely due to the shift to the MCCRS. Furthermore, many schools had previously modified

their curriculum and instructional programs as part of their overall strategies that resulted in the performance successes made over the past several years. However, there were no commonalities in terms of the specific curriculum and instructional programs adopted, except for a greater focus on phonemic awareness, phonics, vocabulary, and fluency in the elementary reading programs. Every school was aligning its current curriculum program to new county school system guidelines, including using many new formative assessments provided by its county education offices.

There also were movements to clarify a more common approach to instructional practice. This resulted both from actions in teacher collaborative groups, where instructional strategies and interventions were discussed and assessed, and in the broader ongoing activities of the faculties to identify what pedagogical practices worked in their schools.

The schools had strong instructional leadership, provided by principals as well as teacher leaders. Teachers coordinated grade-level collaborative teams, and in a few instances school-wide curriculum teams, and were involved in school-wide teams that developed individual education programs for students with disabilities.

School cultures were characterized by school-wide and individual accountability. Administrators and teachers in the case study schools viewed their success in terms of the impact of their strategies on student academic achievement. If high levels of achievement were maintained, overall levels of achievement improved notably, or achievement gaps were diminishing, the administrators and faculties concluded it was largely due to their instructional efforts. If achievement did not produce these results, the attitude was to go back to the drawing boards and revise their instructional approaches.

Given the sample size, it was not possible to determine if the specific improvement strategies used across schools differed for purposes of maintaining high levels of performance, producing large gains in performance, or reducing achievement gaps linked to poverty or minority status. A review of all cases does not seem to indicate that such differences existed. All schools had goals focused on 1) improving their curriculum and instructional programs; 2) identifying the most effective instructional practices; 3) organizing teachers into collaborative work teams that used student data to plan instruction and interventions; 4) providing a variety of extra help services to students struggling to learn to standards; 5) engaging both administrators and teachers in instructional leadership; and 6) creating a cohesive and collaborative culture in which school staff took responsibility for the results of their actions on student achievement. Research also confirms the effectiveness of these common strategies.

Most schools took teacher quality very seriously. Indeed, when asked how the schools had produced their impressive results, several principals (and teachers) immediately said, “teacher talent.” These schools often partnered with local teacher training institutions and/or tried to hire only individuals who had student taught or otherwise had worked in the school in some capacity so their skills and work habits, and degree to which they fit into the school culture, were known.

In general, the improvement strategies in these schools were similar to those embedded in the EB model. The schools had goals focused on improving student performance in reading and math, and often also goals to reduce achievement gaps.

To accomplish those goals, the schools:

- Revised their curriculum and instructional approaches, often adopting new instructional materials;
- created common approaches to effective instructional practice;
- organized teachers into collaborative work groups that met multiple times during the week;
- engaged teachers in ongoing data-based decision making;
- provided multiple interventions, including tutoring and other push-in and pull-out strategies, extended-day academic help and summer school programming; and
- created collaborative school cultures in which faculties took responsibility for the student achievement outcomes of the school.

Most schools also sought to recruit and retain high-quality teacher talent, often hiring only individuals who had worked in the school in some capacity before being hired into a permanent teacher role.

The schools had class sizes that were in the range of the EB model, somewhat above the EB model at the elementary level and close to the EB model in secondary schools. All schools had a mix of core and elective teachers, so were able to offer a full liberal arts curriculum program that was being revised to reflect MCCRS. The schools' extra help strategies for providing additional instructional and student support for students at risk of academic failure seemed to be in the range of resources provided by the EB model as well, including the EB model's extended-day and summer school provisions.

Evidence-Based Approach Total Base Cost and Weights

Using all the evidence-based research, EBPI panel discussions, and case studies, the study team determined a per pupil base amount and weights for students with special needs using school-level cost figures for each grade configuration, along with the distribution of students at each grade level. The study team then added district-level costs to develop total base costs and weights for each identified student population.

For personnel salaries used to create these cost estimates, the study team used MSDE data on statewide average salaries for different personnel categories and available data on statewide benefit amounts and rates, supplemented by data collected from districts. See Appendix B for more detail on salaries and benefits used.

As shown in Table 2.5, below, the per student base cost is \$10,514. The prekindergarten weight is 0.40. The weights for the other student populations were: 0.29 for at risk, 0.37 for LEP, and 0.70 for students with mild and moderate disabilities.³⁶

³⁶ Under the EB model, the cost of students with more severe disabilities is assumed to be funded by the State. The 0.70 weight does not cover the costs for these students.

Table 2.5
EB Total Base Cost and Additional Weights

Base	\$10,514
Weights	
Prekindergarten	0.40
At Risk	0.29
LEP	0.37
Special Education Weight (Applied Just to Students with Mild and Moderate Disabilities)*	0.70
<i>*Note that the evidence-based special education weight presented is only for mild and moderate special education students.</i>	

III. Professional Judgment Approach to Adequacy

The **professional judgment** (PJ) approach relies on the experience and expertise of educators in the State to identify the resources needed to ensure that all districts, schools, and students can meet state standards and requirements. Resources include school-level personnel, non-personnel costs, additional supports and services, technology, and district-level resources. These resources are first identified for students with no identified special needs (which allows for the calculation of a base cost) and then separately for special needs students, presented as weights.

The PJ approach is distinct from the successful school district (SSD) approach and similar to the evidence-based (EB) approach. Like the EB approach, the PJ approach is able to identify of resources for special needs students and is also able to address future standards and performance expectations, a benchmark for academic success that is higher than the benchmark for the SSD approach.

Creating Representative Schools and a Representative District

The PJ approach estimates the costs of adequacy by developing representative schools and one or more representative districts. Representative schools are designed using statewide average characteristics to represent schools across the State. This includes identifying both averages for school sizes and grade configurations as well as identifying average demographics for at risk, LEP, and special education students. For the PJ panels, the term at risk was used to refer to students that struggle academically using FRPM eligibly as a proxy.

In Maryland, average school and district sizes (in rounded figures) are 450 students for elementary schools, 720 for middle schools, and 1,200 for high schools, with an average district size of over 30,000. Statewide, the average demographics are 44 percent of students qualify for FRPM, seven percent are LEP students, and 12 percent are special education students. For the purposes of this study in Maryland, the study team also identified the relationship between resources and student need concentration levels for at risk and LEP populations. For the at risk population, three concentration levels (25 percent, 50 percent, and 75 percent) were examined. For the LEP population, two higher concentration levels (20 percent and 60 percent) were considered in addition to the statewide average of seven percent. For special education, the study team disaggregated the 12 percent statewide average into three categories of need: (1) mild (eight percent), (2) moderate (three percent), and (3) severe (one percent).

The study team created the representative schools and one representative district this way so they would closely resemble actual schools and districts, on average, in the State. This allowed PJ panelists to comfortably estimate what resources are needed, since the representative schools and district looked familiar. At the same time, the approach developed per student figures that can be applied in each unique district and school in Maryland based on real enrollment figures and demographics.

Table 3.1 identifies the representative schools and representative district for Maryland, including demographics.

Table 3.1
PJ Representative Schools and District

	Prekindergarten Program	Elementary School	Middle School	High School	District
Enrollment	60	450	720	1,200	30,000
Special Need Populations					
At risk, 25% Concentration		113	180	300	7,500
At risk, 50% Concentration		225	360	600	15,000
At risk, 75% Concentration		338	540	900	22,500
LEP, 7% Concentration		32	50	84	2,100
LEP, 20% Concentration		90	144	240	6,000
LEP, 60% Concentration		270	432	720	18,000
Special Education- Mild (8%)		36	58	96	2,400
Special Education- Moderate (3%)		14	22	36	900
Special Education- Severe (1%)		5	7	12	300

Professional Judgment Panel Design

Based on the study team’s experience using the PJ approach in other states, the study team felt that it was best to use multiple levels of PJ panels because: 1) multiple panels allow for the separation of school-level resources (which include teachers, supplies, materials, and professional development) from district-level resources (which include facility maintenance and operation, insurance, and school board activities); and 2) the study team believes strongly in having each panel’s work reviewed by another panel for the consensus approach to be effective.

The PJ panel structure in Maryland was designed as follows:

1. School-level panels: the study team first held four school-level panels based on grade-level (prekindergarten, elementary, middle, and high school). Each of these panels focused first on the resources needed to serve students with no special needs; then, they identified the additional resources needed to serve at students.
2. Special needs panels: next, two special needs panels (one for special education and one for LEP) were held to review the work of the previous panels that identified the resources for the base and for at risk students and then identified the additional resources needed to serve special education and LEP students.
3. District panel: the next panel was a district-level panel that reviewed the work of the previous school-level and special needs panels and then identified the needed district-level resources.
4. Chief Financial Officers (CFO) panel: the study team also held a panel specifically with CFOs to review all non-personnel costs, both at the school- and district-level, identified by previous panels.
5. Statewide panel: the study team held a final, statewide panel to review the work of all previous panels to attempt to resolve any remaining inconsistencies that arose across panels.

Panels each had between six and eight participants, including a combination of classroom teachers, principals, personnel who provide services to students with special needs, superintendents, technology specialists, and school business officials. Districts were asked to nominate educators in these key positions whom they believed would be best able to help the study team identify the resources needed to ensure student success. Where possible, teacher participants were selected from a list of master teachers previously vetted by MSDE. In total, over 65 panelists participated in nine PJ panels. A list of panel members is provided in Appendix B to this report.

Panels were held from October 2015 to January 2016 in Baltimore at MSDE’s offices. Table 3.2 provides the dates of these meetings.

Table 3.2
PJ Panel Dates

Date	Panel
October 13-14, 2015	Elementary School Panel; Middle School Panel
October 15-16, 2015	Prekindergarten Panel; High School Panel
October 28, 2015	Special Education Panel
October 29, 2015	LEP Panel
November 17-18, 2015	District-level Panel
January 12, 2016	CFO Panel
January 14, 2016	Statewide Review Panel

Panelists were not compensated for their participation, though meals were provided and some expenses, like mileage and parking fees, were reimbursed.

Summarizing Maryland State Standards and Requirements

Prior to the commencement of any PJ panel discussions, all panelists first reviewed a specific set of background materials and instructions prepared by the study team. Panelists were instructed that their task was to identify the resources needed to meet all Maryland standards and requirements, which included MCCRS and graduation requirements, as well as additional requirements for schools and districts around assessment, accountability, and educator evaluation. The study team prepared a brief summary document of these standards and requirements, which was reviewed by MSDE. This document was then shared with panelists (Appendix B). The document was not meant to be exhaustive, as all panel participants were experienced educators in Maryland; instead, it was meant to highlight key expectations and recently revised expectations, like the forthcoming change to the compulsory education age requirement (rising to 18 for the 2017-18 school year) and the requirement of an additional high school mathematics course (that started with freshman in 2014-15). Panelists were instructed to use the summary document, in conjunction with their knowledge of other critical education policies and practices in Maryland, to guide their allocations of resources needed to increase the number of Maryland students meeting or exceeding standards. The instructions and background information used at the PJ panels can be found in Appendix B.

Using Best Practice Research and Professional Association Recommendations as a Starting Point for PJ Panels

The study team provided the PJ panels with some starting point figures from a review of best practice research and with any staffing recommendations that were available from educator professional associations. These figures were used to prompt discussion. Panelists were in no way constrained by these recommended figures. Instead, they could adjust the figures as they saw fit to best suit Maryland and add in additional necessary staffing positions that were not addressed in the starting point figures.

The Tables 3.3 through 3.6 summarize the starting point figures that were shared with the panelists based upon the team’s research review and recommendations from professional associations, as available. Note that where “Rec.” is indicated, the research or professional associations indicated that such a resource should be in place but a specific resource level was not identified.

Table 3.3
Research-Based and Professional Association Starting Point Personnel Figures
Elementary School of 450 Students

Personnel Position	Research-Based Recommendations	Professional Association Recommendations
Instructional Staff		
Classroom Teachers	22.5-26.0	26.0
Specials Teachers (art, music, PE, world language, etc.)	Rec.	Rec.
Instructional Facilitators (Coaches)	2.3	
Interventionists	1.0	
Librarians/Media Specialists	1.0	1.0
Technology Specialists		
Instructional Aides		
Pupil Support Staff		
Counselors	1.8	1.8
Nurses	1.0	0.6
Psychologists		0.6
Social Workers		1.1
Family Liaisons		
Administrative Staff		
Principal	1.0	1.0
Assistant Principals		1.0
Clerical	2.0	
Other Staff		
IT Technicians		1.8
Duty Aides	Rec.	

The study team’s research review produced a range of class sizes that were shown to positively impact student success, from 15-20 in kindergarten through grade three and from 20-25 in grades four and five. The National Education Association recommended class sizes of 15:1 in kindergarten through grade three, then small class sizes in higher grades but not a specific figure. The study team therefore used

25:1 for grade four and five to create a comparison starting point figure. Other special teachers were also recommended but not at a specific resource level. Other key recommendations out of both the research and professional association recommendations were related to counselors (both the research and the American School Counselor Association recommended staffing at 250:1), librarians (both sources recommending one per school), nurses (research recommending one per school and the National Association of School Nurses recommending staffing at 750:1 for the general student population), and principals (one per school). The research review also recommended instructional coaches, technology specialists, teacher tutors/interventionists, clerical staff, and duty aides. Additional professional association recommendations were 500:1 to 700:1 for psychologists based upon school need (National Association of School Psychologists), 400:1 for social workers (School Social Work Association), the addition of an assistant principal (one per school at the elementary and middle school level, one or more at the high school level, as recommended by the National Association of Elementary School Principals and National Association of Secondary School Principals), and 250:1 staffing for IT positions (International Society for Technology in Education, NETS Standards).

Table 3.4
Research-Based and Professional Association Starting Point Personnel Figures
Middle School of 720 Students

Personnel Position	Research-Based Recommendations	Professional Association Recommendations
Instructional Staff		
Teachers	41.1	
Instructional Facilitators (Coaches)	3.6	
Interventionists	1.0	
Librarians/Media Specialists	1.0	1.0
Technology Specialists		
Instructional Aides		
Pupil Support Staff		
Counselors	2.9	2.9
Nurses	1.0	1.0
Psychologists		1.0
Social Workers		1.8
Family Liaisons		
Administrative Staff		
Principal	1.0	1.0
Assistant Principals		1.0
Clerical	2.0	
Other Staff		
IT Technicians		2.9
Duty Aides		

The research review recommended class sizes of 25:1 on a block schedule, with teachers teaching three out of four blocks. As noted, there was not a specific class size recommendation from the professional

associations, so a specific figure was not included as a starting point. All other staffing positions used similar ratios as the elementary recommendations.

Table 3.5
Research-Based and Professional Association Starting Point Personnel Figures
High School of 1,200 Students

Personnel Position	Research-Based Recommendations	Professional Association Recommendations
Instructional Staff		
Teachers	64.0	
Instructional Facilitators (Coaches)	6.0	
Interventionists	1.0	
Librarians/Media Specialists	1.0	1.0
Technology Specialists		
Instructional Aides		
Pupil Support Staff		
Counselors	4.8	4.8
Nurses	1.0	1.7
Psychologists		1.7
Social Workers		3.0
Family Liaisons		
Administrative Staff		
Principal	1.0	1.0
Assistant Principals		1.0
Clerical	2.0	
Other Staff		
IT Technicians		4.8
Duty Aides		

The research review recommended the same class sizes (25:1) and schedule (a four-period block) as the middle school level for the high school level. As noted, there was not a specific class size recommendation from the professional associations, so a specific figure was not included as a starting point. All other staffing positions used similar ratios as the elementary recommendations.

The study team also provided starting point figures from the research review for non-personnel costs, as shown in Table 3.6.

Table 3.6
Evidence-Based Starting Figures for School-Level Non-Personnel Costs

Cost Category	Research-Based Starting Figures		
	Elementary School	Middle School	High School
Professional Development	10 days per teacher; \$100 per student	10 days per teacher; \$100 per student	10 days per teacher; \$100 per student
Supplies and Materials	\$165 per student	\$165 per student	\$200 per student
Student Activities	\$250 per student	\$250 per student	\$250 per student

It is important to note that the study team's research review did not identify resources beyond the school-level items listed above (e.g. district-level resources).

Professional Judgment Panel Procedures

Once panelists were provided with instructions and background information to guide their efforts (as described previously), PJ panels convened and followed a specific procedure. At least two study team members attended each panel meeting to facilitate the discussion and to take notes about the level of resources needed, as well as the rationales behind participant decisions. Panelists were frequently reminded that they should be identifying the resources needed to meet state standards in the most efficient way possible without sacrificing quality.

Each panel discussed the following school-level resource needs:

1. Personnel, including classroom teachers, other teachers, psychologists, counselors, librarians, teacher aides, administrators, nurses, etc.
2. Other personnel costs, including the use of substitute teachers and time for professional development.
3. Non-personnel costs, such as supplies, materials and equipment costs (including textbook replacement and consumables), plus the costs of offering extracurricular activities.
4. Non-traditional programs and services, including before- and after-school programs, prekindergarten, and summer school programs.
5. Technology, including hardware, software, and licensing fees.

District-level panels also addressed the following district-level resource needs:

1. Personnel, including central office administrators, special programs directors and coordinators, and support staff.
2. Non-personnel costs, such as maintenance and operation, insurance, safety and security, adoption of textbooks, assessment, contract services, and out-of-district placements.

PJ panels first identified the above resources for students with no special needs, and then addressed the additional resources needed to serve special needs students (at risk, special education, and LEP). Keeping these costs separate allowed for the creation of a base cost and additional special needs weights (discussed in greater detail later in this report).

As described in the previous section, the study team provided PJ panelists with starting point figures in a limited number of personnel categories from both the study team's research review as well as recommendations from professional associations. These figures were used to prompt discussion.

Panelists were in no way constrained by these recommended figures or limited to these personnel categories; instead they could identify resources as they saw fit to meet Maryland standards.

For each panel, the figures the study team recorded represent general consensus among members. At the time of the meetings, no participant (either panel member or study team member) had a precise idea of the costs of resources being identified. (The study team's costing of resources took place at a later date.) This is not to say that panel members were unaware that higher levels of resources would produce higher base cost figures or weights. However, without specific price information and knowledge of how other panels were proceeding, it would have been impossible for any individual or panel to suggest resource levels that would lead to specific base cost figures or weights, much less to costs that were relatively higher or lower than others.

Professional Judgment Resources Identified

While panels varied in the resources they identified as necessary for an adequate education, several key recommendations were common across panels:

- Small class sizes, with student-to-teacher ratios of 15:1 in kindergarten through grade three and 20:1 in grades four and five;
- significant time for teacher planning, collaboration, and imbedded professional development with instructional coaches. At each level this was essentially teachers teaching 70-75 percent of the day with the remaining time available for the listed activities. Given the amount of time available within the school day for professional development, the panels did not indicate a need for any additional professional development days;
- a high level of student support (counselors, social workers, behavior specialists, and pupil personnel workers (PPWs)) available for all students;
- sufficient administrative support in the form of assistant principals to allow for required staff evaluations to be done well;
- before- and after-school programs and school-level summer school for at risk students, particularly at the elementary level;
- technology-rich learning environments, including 1:1 student devices, and associated IT support;
- sufficient staff to serve special education and LEP students;
- prekindergarten for all four-year-olds.

It should be noted that the resources PJ panels identified here are examples of how funds might be used to organize programs and services in representative situations. Further, there were separate panels for each school level, so approaches may vary in how they identified resources, but subsequent review panels felt the differences were appropriate. The study team cannot emphasize strongly enough that the resources identified are not the only ways to organize programs and services to meet state standards. Instead, the purpose of the exercise is to estimate the overall level of resources and therefore the cost of adequacy, not to determine the best way to organize schools and districts.

School-Level Personnel

PJ panels discussed and recommended staffing, including:

- **Instructional staff**, including teachers, instructional aides, instructional coaches, interventionists, librarian/media specialists, and technology specialists;
- **pupil support staff**, including counselors, nurses, pupil personnel workers (PPWS), social workers, behavior specialists, and alternative-to-suspension instructors;
- **administrative staff**, including principals, assistant principals, bookkeepers, and clerical/secretarial staff; and
- **other staff members**, including school resource officers, testing/data coordinators, and media aides.

Tables 3.7a through 3.7d first identify the school or program size, and the panel recommended average class size. The tables then identify the personnel on a FTE basis needed to serve all students, regardless of need, at the prekindergarten, elementary, middle, and high school settings (base education). Subsequent tables identify the additional personnel needed to serve special needs students.

As noted previously, separate panels at each level identified these resources and as a result, specific resources and approaches may vary from level to level. As these resources are not intended to be prescriptive, subsequent review panels allowed for variation as long as they felt the differences were reasonable.

Table 3.7a
Prekindergarten Program Personnel as Recommended
by Maryland PJ Panels, Base Education

Program Configuration and Size	60 four-year-olds
Recommended Average Class Size	15:2 (one teacher and one instructional aide)
Instructional Staff	
Teachers	4.0
Specials Teachers	0.5
Instructional Facilitators (Coaches)	1.0
Instructional Aides	4.0
Pupil Support Staff	
Counselors	0.2
Psychologists	0.1
Speech Therapist	0.2
Behavior Specialists	0.2
Family Liaisons	0.25
Administrative Staff	
Clerical	0.1
Other Staff	
Duty Aides	0.25

Resources for the prekindergarten program were identified with the assumption that it would be a school-based program in an existing elementary school. The program was designed to serve all four-year-olds. Panelists recommended an average class size of 15:2, with one teacher and one instructional aide for every 15 students. Additional specials teacher staffing was identified to allow for teacher planning and collaboration time, as well as instructional coaches to provide embedded professional development for prekindergarten teachers. Meaningful pupil support was also recommended.

Table 3.7b
Elementary School Personnel as Recommended by
Maryland PJ Panels, Base Education

School Configuration and Size	K-5, 450 students
Recommended Average Class Size	Grades K-3: 15:1 Grades 4-5: 20:1
<i>Instructional Staff</i>	
Teachers	27.5
Specials Teachers	4.0
Instructional Facilitators (Coaches)	3.0
Librarians/Media Specialists	1.0
Technology Specialists	1.0
Media Aides	1.0
Instructional Aides	2.5
<i>Pupil Support Staff</i>	
Counselors	1.8
Nurses	1.0
Psychologists	0.2
Social Workers	0.2
PPWs	0.2
Behavior Specialists	0.4
Alternative to Suspension Instructor	1.0
<i>Administrative Staff</i>	
Principal	1.0
Assistant Principals	2.0
Bookkeeper	1.0
Clerical	2.0
<i>Other Staff</i>	
IT Technicians	1.0
Substitutes	1.0
Test/Data Coordinator	1.0

For the average elementary school of 450 students, the panelists recommended an average class size of 15:1 in kindergarten through grade three and 20:1 for grades four and five, for a total of 27.5 classroom teachers. Panelists also identified four other specials teachers to teach subjects like art, music, physical education, and world language, and to allow for sufficient planning and collaboration time for classroom teachers. The panelists also felt that the librarian/media specialist and technology specialist (whose

primary role is to provide coaching to teachers on incorporating technology in the classroom) could also provide additional instruction and release time. Other key staffing included a high level of pupil support across a variety of positions (the local school site to determine the specific pupil support positions that would be the best fit for their school), IT staff for the 1:1 student devices recommended, assistant principals to handle required educator evaluations, and a full-time substitute teacher to provide continuity of instruction.

Table 3.7c
Middle School Personnel as Recommended by Maryland PJ Panels, Base Education

School Configuration and Size	Grades 6-8, 720 students
Recommended Average Class Size	25:1
Schedule	Five-period day (modified block); teachers teaching three-and-a-half periods
Instructional Staff	
Teachers	41.1
Instructional Facilitators (Coaches)	4.0
Interventionists	1.0
Librarians/Media Specialists	1.0
Media Aides	1.0
Technology Specialists	1.0
Pupil Support Staff	
Counselors	2.9
Nurses	1.0
Psychologists	0.5
Social Workers	1.0
PPWs	0.5
Behavior Specialists	1.0
Alternative to Suspension Instructors	1.0
Administrative Staff	
Principal	1.0
Assistant Principals	3.0
Bookkeeper	1.0
Clerical	3.0
Other Staff	
IT Technicians	1.5
School Resource Officer	1.0
Test/Data Coordinator	1.0
Substitute	1.0

For the average middle school of 720 students, panelists felt that 25:1 was an appropriate average class size. Panelists also based their staffing of middle school grades on a five-period modified block day (blocks of varying lengths), with teachers teaching on average of three and a half classes a day (perhaps varying by day or semester) to allow an average of 30 percent of the day for planning, collaboration, and

embedded professional development. This resulted in a total of 41.1 teachers; at the secondary level no distinction is made between classroom or specials teachers and is instead presented as a total teachers figure. As was the case at the elementary level, panelists also identified significant pupil support services needed for all students and administrators to address evaluations.

Table 3.7d
High School Personnel, as Recommended by
Maryland PJ Panels, Base Education

School Configuration and Size	Grades 9-12, 1,200 students
Recommended Average Class Size	25:1
Schedule	Eight-period day; teachers teaching five-and-a-half periods
<i>Instructional Staff</i>	
Teachers	41.1
Instructional Facilitators (Coaches)	4.0
Interventionists	1.0
Librarians/Media Specialists	1.0
Media Aides	1.0
Technology Specialists	1.0
<i>Pupil Support Staff</i>	
Counselors	2.9
Nurses	1.0
Psychologists	0.5
Social Workers	1.0
PPWs	0.5
Behavior Specialists	1.0
In-School Suspension Instructors	1.0
Alternative-to-Suspension Instructors	1.0
<i>Administrative Staff</i>	
Principal	1.0
Assistant Principals	4.0
Athletic/Activities Director	1.0
Bookkeeper	1.0
Clerical	5.0
<i>Other Staff</i>	
IT Technicians	2.0
School Resource Officer	1.0
Test/Data Coordinator	1.0

For the average high school of 1,200 students, panelists kept the same average class size of 25:1 that they used for the middle schools, then recommended an eight-period day (or a four-block day) to allow for a wide range of courses to be offered so that students could meet all graduation requirements. Teachers would teach five and a half periods on average, or about 70 percent of the day, to again allow

for meaningful collaboration and embedded professional development. The panelists also identified additional pupil support staff, administrators to manage evaluations, and other staff.

Tables 3.8a through 3.8c identify the resources needed to serve at risk, LEP, and special education students. It is important to note that these tables identify certain positions as school-level personnel, even though some school districts may house these positions centrally; additional personnel not shown here are also identified at the district-level (Tables 3.13a-c).

Table 3.8a
Additional Personnel Needed to Serve At Risk Students Identified by Maryland PJ Panels

Elementary School			
Concentration	25%	50%	75%
# of At Risk Students	113 students	225 students	338 students
Instructional Staff			
Teachers		2.5	2.5
Specials Teachers		0.5	0.5
Interventionists	2.0	4.0	6.0
Instructional Aides	2.5	2.5	5
Pupil Support Staff			
Health Aides		1.0	1.0
Psychologists	0.2	0.8	0.8
Social Workers	0.2	0.2	0.2
Family Liaisons	1.0		
School Based Site/Service Coordinator		1.0	2.0
Administrative Staff			
Assistant Principals			0.5
Middle School			
Concentration	25%	50%	75%
# of At Risk Students	180 students	360 students	540 students
Instructional Staff			
Teachers	2.5	5.0	10.0
Instructional Facilitators (Coaches)		1.0	1.0
Interventionists		2.0	2.0
Pupil Support Staff			
Health Aides		1.0	1.0
Psychologists	0.25	0.5	0.75
Social Workers	0.5	1.0	1.5
PPWs		0.5	0.5
Family Liaisons		1.0	1.0
Alternative to Suspension Instructor		1.0	1.0
Administrative Staff			
Dean		1.0	1.0
Clerical		0.25	0.5
Other Staff			
Substitute		1.0	1.0

High School			
Concentration	25%	50%	75%
# of At Risk Students	300 students	600 students	900 students
Instructional Staff			
Teachers	5.82	11.6	17.5
Instructional Facilitators (Coaches)		2.0	2.0
Pupil Support Staff			
Psychologists		1.0	1.0
Social Workers	0.25	0.5	1.0
PPWs	0.5	1.0	2.0
Family Liaisons		1.0	1.0
In School Suspension Instructors			1.0
Administrative Staff			

As shown in Table 3.8a, resources identified for at risk students are above and beyond the resources identified in the base. Further, the resources identified were distinct for each concentration level and should not be considered cumulatively, i.e. a school with a 50 percent concentration level of at risk students would only receive the resources in the 50 percent column, and not the resources identified in the other columns (the columns are either/or).

Panelists identified the need for additional teaching staff to reduce class sizes, interventionists to work directly with students, instructional coaches to provide professional development to teachers, further pupil support staff — including site-based, community coordinators to work with local agencies to offer services as identified by the elementary panel, and some additional administrative support. The specific additional resources varied by concentration level, with fewer resources being needed at the 25 percent concentration level, and significantly increasing once the 50 percent concentration level, viewed as a tipping point, was reached.

Table 3.8b
Additional Personnel Needed to Serve LEP Students Identified by Maryland PJ Panels

Elementary School			
Concentration	7%	20%	60%
# of LEP Students	32 students	90 students	270 students
Instructional Staff			
Teachers	2.0	6.0	11.0
Instructional Facilitators (Coaches)	0.2	0.5	1.0
Pupil Support Staff			
Family Liaisons	0.2	0.5	1.0
Administrative Staff			
LEP Coordinators	0.5	1.0	1.5
Middle School			
Concentration	7%	20%	60%
# of LEP Students	50 students	144 students	432 students
Instructional Staff			
Teachers	3.5	9.0	15.0
Instructional Facilitators (Coaches)	0.2	0.5	1.0
Interventionists	0.5	1.0	2.0
Instructional Aides	1.0	2.0	5.0
Pupil Support Staff			
Family Liaisons	0.5	1.0	2.0
Administrative Staff			
LEP Coordinators	0.5	1.0	1.5
High School			
Concentration	7%	20%	60%
# of LEP Students	84 students	240 students	720 students
Instructional Staff			
Teachers	4.0	9.0	20.0
Instructional Facilitators (Coaches)	0.3	0.8	1.5
Interventionists	2.0	4.0	4.0
Instructional Aides	5.0	5.0	5.0
Pupil Support Staff			
Family Liaisons	0.5	1.0	2.0
Administrative Staff			
LEP Coordinators	0.5	1.0	1.5

Panelists identified a well-resourced service model for LEP students, including instructional support, coaching, pupil support, and coordination. Panelists felt that it was hardest to serve students in lower-concentration settings, therefore staff-to-student ratios were lowest at the seven percent concentration level and increased at the higher concentration levels, representing the economies of scale that could be experienced by serving a larger population of LEP students.

Table 3.8c
Additional Personnel Needed to Serve Special Education Students Identified by Maryland PJ Panels

Elementary School			
Need Level	Mild (8%)	Moderate (3%)	Severe (1%)
# of Special Education Students	36 students	14 students	5 students
Instructional Staff			
Teachers	1.0	1.0	1.0
Instructional Aides	1.0	1.0	1.0
Pupil Support Staff			
Speech Pathologist	0.7	0.1	0.2
Other Therapists		0.1	0.2
Behavior Specialists	0.1	0.05	0.05
Administrative Staff			
IEP Coordinator	0.2	0.1	0.1
Middle School			
Need Level	Mild (8%)	Moderate (3%)	Severe (1%)
# of Special Education Students	180 students	360 students	540 students
Instructional Staff			
Teachers	1.0	1.0	1.0
Instructional Aides	1.0	1.0	1.0
Pupil Support Staff			
Speech Pathologist	0.7	0.1	0.2
Other Therapists		0.1	0.2
Behavior Specialists	0.1	0.05	0.05
Administrative Staff			
IEP Coordinator	0.2	0.1	0.1
High School			
Need Level	Mild (8%)	Moderate (3%)	Severe (1%)
# of Special Education Students	300 students	600 students	900 students
Instructional Staff			
Teachers	1.0	1.0	1.0
Instructional Aides	1.0	1.0	1.0
Pupil Support Staff			
Speech Pathologist	0.7	0.1	0.2
Other Therapists		0.1	0.2
Behavior Specialists	0.1	0.05	0.05
Administrative Staff			
IEP Coordinator	0.2	0.1	0.1

For special education students with mild disabilities, panelists indicated at the elementary level that student need in this category would primarily be for speech services. The proportion of students with identified speech needs greatly decreases in secondary grades; so special education students with mild disabilities in higher grades predominately represent learning disabilities. Staffing reflects this shift in need by grade level, with a teacher case load ratio of 36:1 and a high level of speech therapist support in elementary school, then a lower teacher case load of about 20:1 in middle and high school, with little to no speech support. Additionally, panelists recommended IEP coordination at all grades, some behavior

interventions and other pupil support in secondary grades, and transition support at the high school level.

For special education students with moderate disabilities, panelists felt there should be a teacher ratio, or caseload, of 11:1 to 14:1, with an instructional aide paired with each teacher. Panelists also identified a need for support from therapists/other pupil support staff and IEP coordination, as well as job coaches and transitions coordinators for high school students.

For special education students with severe disabilities, panelists felt there should be a teacher ratio, or caseload, of about 5:1, with at least one instructional aide per teacher. Support from speech therapists, other therapists, behavior specialists, and other pupil support staff was also identified, as was IEP coordinators, job coaches, and transitions coordinators.

Other support positions needed to serve special education students (such as specialized therapists) were identified at the district-level.

School-Level Non-Personnel Costs

Aside from personnel needs, Table 3.9 shows additional school-level non-personnel costs identified.

Table 3.9
School-Level Non-Personnel Costs Identified by Maryland PJ Panels

	Base Education	At Risk	LEP
Professional Development	\$75/ student		
Supplies, Materials, and Equipment	E/S (incl. PreK): \$100/student; M/S and h/s: \$115/student	M/S and H/S: \$20/at risk student	\$20/LEP student
Textbooks	\$25/student		
Assessment	\$5/student		
Student Activities	E/S (incl. PreK): \$20/student; M/S: \$40/student; H/S: \$250/student	E/S and M/S: \$20/at risk student; H/S: \$50/at risk student	E/S and M/S: \$20/at risk student; H/S: \$50/at risk student
Library Materials	\$12/student		
Teacher Stipends	M/S: \$15,000 total H/S: \$30,000 total		
Positive Behavior Interventions and Supports	M/S: \$1,000 total H/S: \$1,000 total		
CTE Supplies, Materials and Equipment	H/S: \$20/student		

Note: all special education non-personnel costs were accounted for at the district level.

Non-personnel cost figures were developed for instructional supplies, materials, equipment, textbooks, assessment, student activities (field trips, sports, extracurricular activities, etc.) professional development, assessment, library materials, and positive behavior intervention and supports (PBIS), and teacher stipends at the secondary level. At the high school level, panelists also identified an amount for CTE supplies, materials and equipment; this amount, in addition to available staffing, would allow for

CTE programming at each high school. A separate CTE center, or centralized program, was also identified at the district-level.

These figures were reviewed by both the CFO panel and then by the statewide panel, considering both what is currently spent and if the resources available in these areas were sufficient. To develop the final estimates, panelists on the statewide panel reviewed the various approaches previous panels had taken and considered existing data on what districts currently spend. Supplies, materials, and equipment and student activities are two areas that panelists felt increased in cost in later grades.

One item shown separately is professional development, shown as a per student figure to cover professional development costs like materials, hired trainers, or conference fees. Panelists did not feel the need for additional days for professional development beyond what is already in current teacher contracts. Instead, panelists emphasized the need for ongoing professional development coaching and peer collaboration embedded in the regular school day. This was reflected in teaching staffing at each grade-level that would allow teachers to have about 30 percent of the day on average to allow for these activities separate from instructional time.

All figures for additional supplies, materials, and equipment, as well as student activities, for at risk and LEP students are in addition to base figures and are only applied to the students in those categories.

School-Level Additional Programs

Tables 3.10a through 3.10c indicate other programs, such as a before- and after-school programs, summer schools and bridge programs, that the panels felt were needed to ensure that schools could meet Maryland state standards and requirements. Programs are shown as elementary, middle, and high school programs; many of these programs are designed with the belief that investments that are made early will alleviate the need for some services later on.

It is important to note that, while the study did not include transportation, panelists felt that additional transportation (e.g. a second bus pickup for students in an after-school program) was necessary for things like before- and after-school programs and summer school to be possible.

Table 3.10a
Elementary Additional Programs Identified by Maryland PJ Panels

	Before- or After-School <i>Before 50 Percent At Risk Concentration Level is Reached</i>	Before- or After-School <i>Once 50 Percent At Risk Concentration Level is Reached</i>	Summer School
Type of Student Served	At risk	At risk	At risk
Percentage of Identified Populations Served	100%	100%	100%
Program Specifics (length of program, length of day)	Eight hours per week	12 hours per week	144 hours
Personnel			
Teachers	15:1 ratio	15:1 ratio	15:1 ratio
Nurses	0.5	1.0	0.5
PPWs	0.2		0.2
Social Workers		0.2	0.4
Behavior Specialists	0.4		
Coordinator	1.0	1.0	1.0
Other Costs			
Supplies, Materials and Equipment	\$30/student	\$50/student	\$30/student
Technology Licensing		\$10/student	
Student Activities	\$20/student	\$20/student	\$20/student
Snacks	\$60/ student	\$60/ student	\$16/ student

Panelists identified the need for before- and after-school programs and summer school for 100 percent of at risk students. For schools with lower concentrations of at risk students (below 50 percent), the panelists recommended an eight-hour per week program (first program column), and once the concentration of at risk students reached the 50 percent level, which was considered a tipping point, this program would change to 12 hours per week (second program column). Other changes once the 12 hour-a-week program would replace the eight hour-a-week program at the higher concentration levels were to have a social worker instead of a PPW, and to have a nurse available full-time before and after school, and additional dollars available for supplies, materials, equipment, and technology licensing.

Shown in Table 3.10b that follows, at the middle school level, panelists identified the need for before- and after-school programs and summer school for a reduced percentage of students compared to the intensive program built at the elementary level, 25 percent of students for before- and after-school and 10 percent of these students for summer school. The middle school panel’s recommendations also differed by specifically targeting LEP students in addition to at risk students for these programs. Panelists also said there should be a bridge program for entering students.

Table 3.10b
Middle School Additional Programs Identified by Maryland PJ Panels

	Before- or After-School	Summer School	Bridge
Type of Student Served	At risk, LEP	At risk, LEP	All
Percentage of Identified Populations Served	25%	10%	(100 students served)
Program Specifics (length of program, length of day)	two hours per day, four days a week	four hours per day, four days per week, four weeks	four hours per day, four days per week, two weeks
Personnel			
Teachers	10:1 ratio	10:1 ratio	10:1 ratio
Coordinator	1.0	1.0	1.0
Other Costs			
Supplies, Materials and Equipment	\$20/student	\$10/student	\$30/student
Student Activities		\$12/student	
Snacks	\$60/student	\$8/student	\$4/student

For high school students, panelists indicated that there should be before- or after-school instructional support available for all students, as well as a bridge program for entering students as shown in Table 3.10c below.

Table 3.10c
High School Additional Programs Identified by Maryland PJ Panels

	Before- or After-School	Bridge
Type of Student Served	All	All
Percentage of Identified Populations Served		(300 students served)
Program Specifics (length of program, length of day)	Two hours per day, four days a week	Four hours per day, four days per week, two weeks
Personnel		
Teachers	2.0	12.0
Coordinator		1.0
Other Costs		
Supplies, Materials and Equipment	\$20/student	\$30/student
Snacks	\$60/student	\$4/student

School-Level Technology Hardware

Tables 3.11a through 3.11d show the technology needs of each school. Panelists called for an array of technology to be available in classrooms, computer labs (fixed or mobile), media centers, and to be available for teachers and administrative staff. Of particular note, panelists recommended one-to-one mobile devices (tablets, netbooks, or similar) for students, beginning in kindergarten. Computer labs were still included, given the need for high-powered machines or dedicated spaces for certain programs and classes.

Table 3.11a
Prekindergarten Program Technology Hardware Identified by Maryland PJ Panels

Hardware Item	# of Units Needed
Faculty	
Laptops	1 per teacher
Classroom	
Printers	1 per classroom
Visual Presentation System	1 per classroom
Document Camera	1 per classroom
Wireless Access Point	1 per classroom
Other	
Student Devices	40 total

Table 3.11b
Elementary School Technology Hardware Identified by Maryland PJ Panels

Hardware Item	# of Units Needed
Administration/Main Office	
Computers	1 per office staff member
Laptops	1 per administrator
Mobile Device	1 per administrator
Printers	1 per administrator
Copier/Printer	1 total
Printers	1 total
Other Computers	10 total
Faculty	
Laptops	1 per teacher
Classroom	
Printers	6 total
Visual Presentation System	1 per classroom
Document Camera	1 per classroom
Wireless Access Point	1 per classroom
Computer Lab(s)-Mobile (2)	
Laptops	20 per mobile lab
Media Center	
Computers	20 total
Other	
Student Devices	1 per student
Headphones	1 per student
Protective Cases	1 per student
LCD TV (digital signage)	2 total

Table 3.11c

Middle School Technology Hardware Identified by Maryland PJ Panels

Hardware Item	# of Units Needed
Administration/Main Office	
Computers	1 per office staff member
Laptops	1 per administrator
Mobile Device	1 per administrator
Copier/Printer	4 total
Faculty	
Laptops	1 per professional
Mobile Device	1 per professional
Classroom	
Computers	2 per classroom
Printers	1 per every 5 teachers
Visual Presentation System	1 per classroom
Document Camera	1 per classroom
Wireless Access Point	1 per classroom
Computer Lab(s)-Fixed (1)	
Computers	30 per fixed lab
Printers	1 per fixed lab
Visual Presentation System	1 per fixed lab
Document Camera	1 per fixed lab
Computer Lab(s)-Mobile (2)	
Laptops	30 per fixed lab
Media Center	
Computers	30 total
Printers	1 total
Visual Presentation System	1 total
Document Camera	1 total
Other	
Student Devices	1 per student
Headphones	1 per student
Protective Cases	1 per student
LCD TV (digital signage)	2 total

Table 3.11d
High School Technology Hardware Identified by Maryland PJ Panels

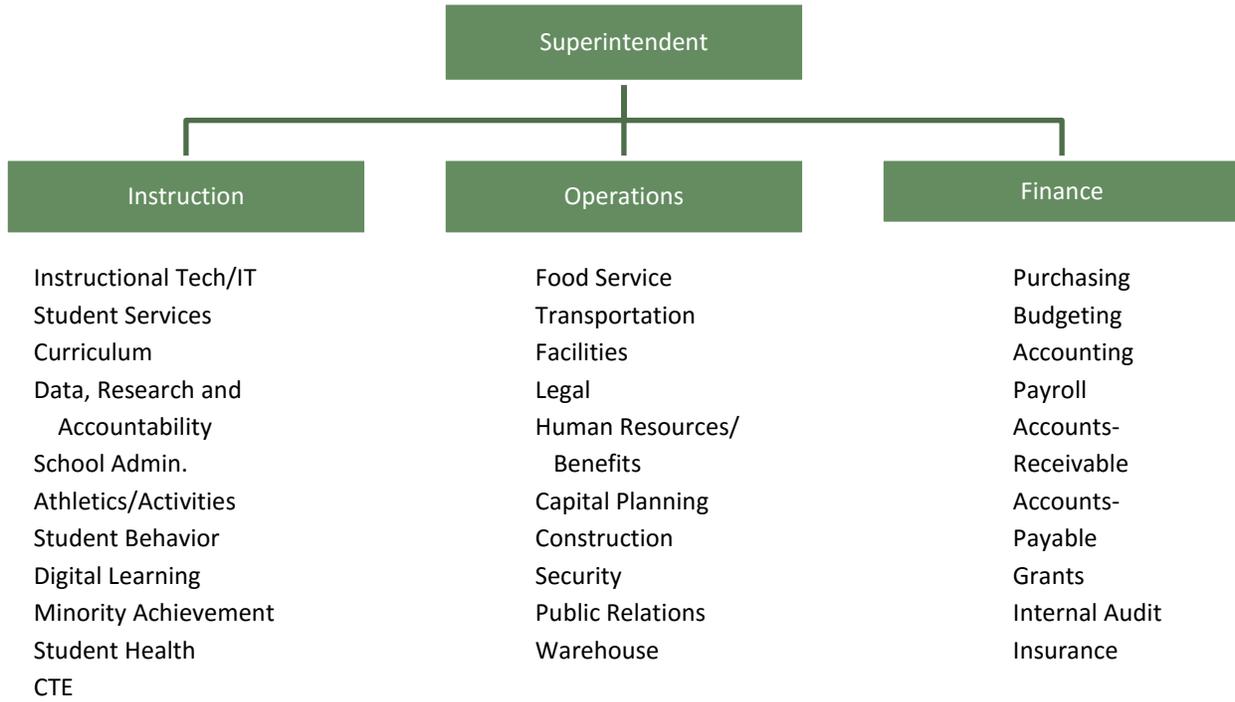
Hardware Item	# of Units Needed
Administration/Main Office	
Computers	1 per office staff member
Laptops	1 per administrator
Mobile Device	1 per administrator
Printers	2 total
Copier/Printer	5 total
Cell Phone	1 per administrator
Faculty	
Laptops	1 per professional
Mobile Device	1 per professional
Classroom	
Computers	2 per classroom
Visual Presentation System	1 per classroom
Document Camera	1 per classroom
Wireless Access Point	1 per classroom
Computer Lab(s)-Fixed (2)	
Computers	30 per fixed lab
Printers	1 per fixed lab
Visual Presentation System	1 per fixed lab
Computer Lab(s)-Mobile (4)	
Laptops	30 per mobile lab
Media Center	
Computers	10 total
Printers	1 total
Other	
Student Devices	1 per student
Computers	3 total
LCD TV (digital signage)	2 total

District-Level Resources

Panelists also identified the resources needed at the district level to support schools. Table 3.12a shows the personnel resources needed for all students (base education).

It is important to note that different districts often use different position titles or levels of personnel to fulfill the same functions or roles. For example, one district may have a CFO, while in another district that same function might be filled by a Business Manager or a Director. Therefore, the panelists first discussed the functions that would need to be fulfilled, shown in Figure 3.1.

Figure 3.1
District Functions



Panelists then identified the number of personnel needed to fulfill these functions in broad personnel categories as shown in Table 3.12a.

Table 3.12a
District Personnel Resources, Base Education Identified
by Maryland PJ Panels

Personnel	FTE
Superintendent	1.0
Assistant/Associate Superintendent	3.0
Executive Director	3.0
Director	14.0
Supervisor	25.0
Coordinator	30.0
Manager	1.0
Secretary/Clerk	64.0
IT Technician	4.0
Nurse	5.0
Specialist	
Other Professional	43.0
Attorney (Systems and Board)	1.0
Teachers	20.0
Database Admin./Programmer	9.0

Panelists also addressed the district-level costs incurred to support schools. Such costs include building maintenance and operation (M and O), district-level technology licensing and hardware, insurance, legal fees, finance and data system fees, and contracted services. The cost of having a CTE center, or centralized program, is also identified; this cost is above and beyond the school-level costs identified that allowed for CTE programming at each high school. A separate CTE center, or centralized program, was also identified at the district level. As noted previously, transportation and capital were not addressed through the PJ approach.

Costs were identified by the CFO and statewide panels, primarily based upon existing district expenditure figures. Some cost areas were already identified at the school-level, so they are not included at the district level (even if often purchased district-wide, such as textbooks) to avoid double counting.

Table 3.12b identifies the additional non-personnel costs at the district-level for base education, shown both as total figures for the 30,000 district and as per student figures.

Table 3.12b
District Non-Personnel Costs, Base Education Identified by Maryland PJ Panels

Cost Area	Total	Per Student
Contracted Services	\$300,000	\$10 per student
Maintenance and Operations	\$37,500,000	\$1,250 per student
Security	In M and O	
Textbooks	School-level	
Supplies and Materials	School-level	
Professional Development	School-level	
Risk Management	\$330,000	\$11 per student
Legal	\$180,000	\$6 per student
Graduation	\$60,000	\$2 per student
School Board/Audit/MABE	\$120,000	\$4 per student
Assessment/Data	\$300,000	\$10 per student
Technology Licensing/ Data	\$1,500,000	\$50 per student
Tech Hardware, incl. servers	\$100,000	\$3 per student
Telecommunications	\$270,000	\$9 per student
Tuition Reimbursement	\$1,200,000	\$40 per student
Unemployment Insurance	\$150,000	\$5 per student
Finance Systems (HR/Payroll), Office Supplies, Reimbursements, etc.	\$1,080,000	\$36 per student
Substitutes	\$2,875,000	\$96 per student
CTE Center Program	\$2,250,000	\$75 per student

Tables 3.13a through 3.13c show the additional district-level resources needed to serve at risk, LEP, and special education students.

Table 3.13a
Additional District Resources to Serve At Risk Students Identified by Maryland PJ Panels

Personnel	
Coordinator	3.0
Secretary/Clerk	1.0
Other Costs	
Alternative School	\$1,870,000

Panelists identified the need for district-level coordination and clerical support for at risk students, as well as resources to support an alternative school in the district.

Table 3.13b
Additional District Resources to Serve LEP Students Identified by Maryland PJ Panels

Personnel	
Coordinator	3.0
Secretary/Clerk	1.0
Interpreter/Translator	1.0
Other Costs	
Contracted Services	\$100,000
Work-based Language Program	\$100,000

Panelists identified the need for district-level coordination and clerical support for LEP students, as well as interpretation/translation support. Additional amounts for contracted services and a work-based language program were identified. The work-based language program was intended for older, newcomer students at the high school-level to support targeted language acquisition in a compressed time period.

Table 3.13c
Additional District Resources to Serve Special Education Students Identified by Maryland PJ Panels

Personnel	
Assistant/Associate Superintendent	
Director	1.0
Supervisor	5.0
Coordinator	7.0
Secretary/Clerk	8.0
Additional Therapists/Specialists	3.0
Teacher	1.0
Other Costs	
Contracted Services	\$1,250,000
Legal	\$120,000
Nonpublic Placement	\$5,281,459
Supplies and Materials (incl. Adaptive Technology)	\$400,000
Extended-School Year (ESY)	\$589,000

Panelists also identified additional personnel and related costs for special education students, regardless of level (so not disaggregated by special education students with mild, moderate, or severe disabilities). These resources included district-level leadership, coordination, and clerical support. Non-personnel cost areas included contracted services; legal services; nonpublic placement for the highest need students; supplies, materials and equipment, including adaptive technology; and extended school year (ESY) services for students whose IEP indicates it is necessary.

Developing Cost Estimates

Once the panels completed their work, the study team undertook the process of costing-out the resources identified above. The primary prices needed to complete this costing-out were the salaries and benefits of personnel and the prices assigned to different kinds of technology hardware. See Appendix B for more detail on salaries and benefits used.

For personnel salaries, the study team used MSDE data on statewide average salaries for different personnel categories and available data on statewide benefit amounts and rates, supplemented by data collected from districts. In determining technology costs, the study team assumed equipment would be replaced every four years for the majority of hardware items. The study team surveyed district CFOs on average costs for each hardware item. See Appendix B for more detail on technology prices used.

School-Level and District-Level Costs

Table 3.14a, shown below, lists the base costs for each representative school, disaggregated into costs for personnel, professional development, non-personnel, technology, and other programs after applying the resource prices noted above.

Table 3.14a
School-Level Base Costs Identified by Maryland PJ Panels

	Elementary School	Middle School	High School
School-level Costs, Base	\$10,513	\$8,838	\$8,442
Personnel Costs	\$9,911	\$8,141	\$7,427
Professional Development	\$75	\$75	\$75
Non-Personnel Costs	\$262	\$319	\$553
Technology	\$266	\$246	\$243
Other Programs	\$0	\$56	\$143

School-level base costs range from \$8,442 to \$10,513. This reflects the panelists' sentiment that providing intensive service at the elementary level will have the greatest impact and reduce the need for significant interventions at the secondary level. Table 3.14b shows the total school-level cost per prekindergarten student.

Table 3.14b
Prekindergarten Program School-level Cost Identified by Maryland PJ Panels

Prekindergarten Program	
School-level Costs	\$12,524
Personnel Costs	\$12,167
Professional Development	\$75
Non-Personnel Costs	\$137
Technology	\$145
Other Programs	\$0

As shown, the school-level cost per prekindergarten student is \$12,524 (this figure is a total figure, not to be added to the base costs in Table 3.14a).

Table 3.14c then shows the additional costs above and beyond the base for identified special needs students, including at risk, LEP, and special education students.

Table 3.14c
School-Level Costs for Special Needs Students Identified by Maryland PJ Panels

Additional School-level Costs Identified	Elementary School	Middle School	High School
At risk			
25% Concentration	\$5,320	\$2,028	\$1,985
50% Concentration	\$6,472	\$3,887	\$2,732
75% Concentration	\$4,130	\$3,685	\$2,627
LEP			
7% Concentration	\$7,486	\$9,835	\$9,874
20% Concentration	\$7,356	\$8,187	\$6,435
60% Concentration	\$4,436	\$5,020	\$3,703
Special Education			
Mild	\$6,140	\$7,361	\$7,228
Moderate	\$11,499	\$13,601	\$14,391
Severe	\$36,096	\$40,199	\$43,591

The figures shown above would be in addition to the base amounts in Table 3.14c. For at risk, identified resources and subsequent per student amounts were highest in elementary school reflecting the panelists strong feelings that early intervention was essential to serving these students. Additionally, the panelists' view that the 50 percent concentration level was a tipping point was also reflected that student amounts were highest at that level, declining somewhat at the 75 percent level. Note the standout figure, 50 percent concentration at the elementary level, is largely driven by an intensive, 12 hour-a-week after-school program they created to serve all at risk students to be implemented once that tipping point was reached. Next, looking at identified costs to serve LEP students, per student figures were highest at the seven percent concentration level and lowest at the 60 percent concentration level reflecting the economies of scale associated with serving a larger population. Approaches to serving these students varied at the three school levels, reflected in varying costs identified. Costs for special education increased with need level, reflecting the higher level of support and service required. Costs were similar across school levels, increasing at the secondary level to allow for needed transition and job coaching.

It is important to be careful in drawing conclusions based on school-level costs, since such costs exclude district-level costs and it is the combination of school and district costs that reflect the true, total costs of providing services. Table 3.15 presents the district-level cost figures for the base, as well as the additional amounts for special needs students.

Table 3.15
District-Level Costs Identified by Maryland PJ Panels

District-level Costs, Base	\$2,121
At risk	\$291
LEP	\$273
Special Education	\$2,745

The additional district-level base cost was \$2,121. The cost of providing the additional supports and services needed at the district level for special needs students was \$291 for at risk students, \$273 for LEP students, and \$2,745 for special education students. Additional district-level resources were not identified for prekindergarten students. (These students would just receive the district-level base cost.)

Professional Judgment Total Base Costs and Weights

The study team then calculated a single, weighted school-level base cost figure. To do this, the study team used school-level cost figures for each grade configuration (Table 3.14a), along with the distribution of students at each grade level. The study team took this same approach to create an average figure for each concentration level of at risk and LEP, and a weighted average figure for the three categories of special education (mild, moderate, and severe disabilities). The study team then added district-level costs from Table 3.15 to develop total base costs and weights for each identified student population. These figures are shown in Table 3.16.

Table 3.16
Professional Judgment Total Base Cost and Additional Weights

Base	\$11,607
Weights	
Prekindergarten	0.26
At risk	
25% Concentration	0.33
50% Concentration	0.43
75% Concentration	0.33
Average	0.36
LEP	
7% Concentration	0.78
20% Concentration	0.65
60% Concentration	0.40
Average	0.61
Special Education	
Mild	0.82
Moderate	1.35
Severe	3.62
Average (Weighted)	1.18

As table 3.16 shows, the per student base cost was \$11,607. The prekindergarten weight was 0.26. Average weights for the other student populations were 0.36 for at risk, 0.61 for LEP, and 1.18 for special education (weighted by the proportion of special education students in each category to produce a single weight³⁷).

³⁷ Based upon eight percent of students in the mild category (67 percent of special education students), three percent of students being in the moderate category (25 percent of special education students), and one percent of students in the severe category (eight percent of special education students). $(0.82 \times 0.67) + (1.35 \times 0.25) + (3.62 \times 0.08) = 1.18$

IV. Successful Schools/School District (SSD) Approach to Adequacy

The **successful schools/school district (SSD)** approach is the third method used to assess the adequacy of Maryland's school finance system. To determine an adequate per pupil base cost amount, this approach makes use of the actual expenditures in the functional areas of administration, instruction, and operations of schools that are currently meeting or exceeding state performance objectives. School performance is most often measured by school-wide performance on state assessments. In Maryland the study team looked at both absolute performance on state assessments and growth in performance over time. This approach assumes that every school and school district should have the same level of base funding that is available to the most successful schools and districts. This approach provides an empirical method for determining an adequate per pupil base or foundation amount of funding, but it does not provide a means of determining what additional funding is needed for services and programs for students with special needs (e.g. at risk, LEP, and students with disabilities) and for districts with special circumstances. That is because in most cases the highest performing schools also tend to have lower concentrations of students with special needs. The research team used its PJ and EB analyses to estimate what these additional funding levels should be. The SSD approach is typically conducted at the district level. However, in Maryland, where there are relatively few school districts, the approach was applied at the school-level.

The steps to conducting an SSD analysis are: 1) identify high-performing schools and schools that are dramatically improving; 2) analyze school spending levels (excluding spending targeted for student need-based programs such as compensatory education, special education, or LEP); and 3) determine a per pupil base spending amount from the school expenditure analysis. Each of these steps is described in more detail below.

Identifying High-Performing Schools

Using the specific performance criteria described below, the study team selected 111 high-performing schools in the first round of school selections for this study. These schools were initially selected using assessment results from the MSA and HSA as the measure of performance. The study team selected schools that were high-performing both in terms of absolute achievement (meaning the percentage of all students at or above proficiency) and those that experienced high levels of growth in achievement over time. The study team also sought to select a mix of elementary, middle, and high schools. One school from this initial group was eventually dropped from the list because it had such a high percentage of low-income students that it was impossible to distinguish base instructional services from services targeted to at risk students. In essence, the school's entire program was designed to serve disadvantaged students. This left 110 schools for the initial school expenditure analysis based on performance on the MSA and HSA.

As noted, MSA and HSA results were used to measure school performance for the initial selection of schools in January 2016. However, the RFP required using two years of results from the new Partnership for Assessment of Readiness for College and Careers (PARCC) assessments (the assessments most aligned with the state's College and Career Ready Standards) when making adequacy estimates. This meant that

the first two years of statewide administration of the PARCC assessment needed to be used for the selection of successful schools. Thus, when the results of the 2014-15 and 2015-16 PARCC tests became available in February 2016 and September 2016 respectively, the relative performance of the selected schools was re-evaluated using the average of the two years of PARCC scores. Schools that experienced a significant drop-off in performance on the PARCC assessments were removed from the list and the cost analyses were rerun. The group of 110 successful schools was reduced by 39 schools to a total of 71 schools. This process is explained in more detail below.

Assessment Data

The annual MSA and HSA assessment data used for selecting the initial set of schools were provided by MSDE. These assessment datasets consisted of school-level records that aggregated student performance data by grade, subject, race/ethnicity, and special needs status (FRPM eligibility, LEP, and special education). The assessment data provided for each category of students included the total number of students in the group taking the test and the number of students scoring at the basic, proficient, and advanced levels. These raw data were then aggregated to a single performance score for each school representing all students in all grades and all subjects.

The subjects included in the assessment data for elementary and middle schools were reading and mathematics in grades three through eight, and science in grades five and eight. For high schools, the subjects included were English, algebra, and biology.

The most recent administrations of the MSA and HSA assessments were not used in the school selection process due to concerns that the assessments were not well aligned with the State's new College and Career Ready Standards adopted in 2012. Because the new PARCC assessments were not available for statewide administration until 2014-15, the State continued to use the MSA for grades three through eight and the HSA for grades nine through twelve until the 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. The impact on average performance on the HSA was less significant. Because of the misalignment between the new standards and the old assessments, MSDE testing staff felt that MSA assessment scores after 2011-12 and HSA scores after 2012-13 were not a valid measure of school performance. As a result, the study's school selections were based on assessment data for the six-year period 2006-07 through 2011-12 for the MSA, and 2007-08 through 2012-13 for the HSA. These are the most recent assessment periods for which both standards and assessments were best aligned.

While the study team shared MSDE's concern with the alignment of standards and assessments, there were also concerns about selecting schools on the basis of nearly three-year-old performance data.

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

- For the MSA, the initial selection of elementary and middle schools was carried out using the 2006-07 through 2011-12 assessment data;

- for the HSA, the initial selection of high schools was carried out using assessment data for the years 2007-08 to 2012-13;
- the difference between the 2011-12 to 2013-14 scores of the schools selected through the initial analysis of MSA data were compared to the mean change in scores for all elementary and middle schools. Selected schools with a falloff of more than one standard deviation were removed from the school list. A similar comparison was not conducted for the HSA because 2013-14 test results were not available at the time; and
- when two years of PARCC data became available, selected schools that performed significantly worse on PARCC relative to other schools than they did on the MSA/HSA were removed from the list of high performing schools.

When PARCC assessment data became available, the results were aggregated to a single total school score (all students/all grades/all subjects) for each year using the same method that was used for the MSA and HSA. Performance levels on the PARCC were equated to those of the MSA and HSA using the recommendations of the Maryland Assessment Research Center.³⁸ Using this approach, the performance of students scoring at PARCC Level 3 or higher were considered to be equivalent to students scoring proficient or above on the MSA and HSA.

The change in schools' performance from the MSA/HSA to PARCC was determined by analyzing whether a school selected as a successful school performed significantly worse on PARCC than the average school in its school level (elementary, middle, or high). To do this, each school's performance on the previous state tests was compared to its average PARCC performance for the two years by converting its average overall score on the MSA/HSA and on the PARCC to z-scores.³⁹ Converting both scores to z-scores allows the two scores to be compared despite the difference in score scales between the assessments. The difference between the two z-scores was then calculated for each school and compared to the mean difference in z-scores for all schools at that level (e.g. an elementary school was compared to the mean of all elementary schools). If the school's difference between its z-scores on the two assessments was more than one half of a standard deviation lower than the mean for all schools at its level, the school was dropped from the successful schools selection. This approach for comparing how much a school's performance changed as it moved from one assessment to the other was used because the research team felt that it placed somewhat less weight on the limited number of available PARCC data points than alternative approaches.

A total of 39 schools were dropped from the successful schools list based on the average of their 2014-15 and 2015-16 PARCC scores, leaving 71 successful schools eligible for the cost analysis. Table 4.1 below compares the characteristics of the initial 110 schools to all schools in the State. Table 4.2

³⁸ See *Investigating the Concordance Relationship between the HSA Cut Scores and the PARCC Cut Scores*, a report to MSDE by the Maryland Assessment Research Center.

³⁹ A z-score is a method for standardizing items that have different scales. A z-score is a measure of how many standard deviations above or below a population or sample mean score is. Z-scores are calculated by subtracting the mean value of all items in a sample or population from the value of a single item and then dividing by the standard deviation.

compares the school characteristics of the revised school selections based on PARCC performance (71 schools) to the initial school selection.

Selection Criteria

To identify the first round of high-performing schools for the study, the research team used the following selection criteria:

1. High-Performing Schools (Absolute Achievement). The criterion used for selecting high-performing elementary and high schools was that at least 95 percent of all students scored proficient or above for each of the six years from 2007-2012 (2008-2013 for high schools). The criterion for middle schools was at least 90 percent of all students scoring proficient or above for each of the six years from 2007-2012.
2. High-Growth Schools (Improving Achievement). The selection criterion used for elementary, middle, and high schools was growth in the proportion of students scoring proficient or above on assessments of at least 40 percentage points from 2006-2012 (2008-2013 for high schools), with a minimum of 80 percent of students achieving at proficient or above in 2012 (2013 for high schools). The minimum overall percentage of 80 percent of students achieving at least proficiency was used to select out schools that may have experienced a high level of growth but continued to have low absolute achievement.

In the past, SSD studies often only used the High-Performing or Absolute Achievement selection criterion. However, using only high absolute performance for selecting schools will typically exclude schools that are making significant improvement in their students' achievement. These schools may not currently meet the absolute standard, but they do seem to be on track to do so over time. Further, these schools also tend to have larger numbers of low-income, LEP, or other special needs students, and are thus useful to include in the SSD analysis because of their demonstrated ability to improve student performance over time. By using both the absolute and growth criteria, the resulting SSD analysis becomes more robust and benefits from using two different definitions of success.

The initial group of 110 schools consisted of 99 High-Performing schools and 11 High-Growth schools. The group included 64 elementary schools, 29 middle schools, and 17 high schools. The schools selected represent 15 different school districts. Table 4.1, below, compares the schools initially selected for the successful schools study with all schools in the State. The schools selected as successful schools tend to be somewhat larger and enroll fewer students with special needs than the average for all schools in the State. The fact that the selected schools, on average, have lower concentrations of special needs students is not surprising given that schools with higher numbers of special needs students tend to perform less well in terms of absolute performance (but not necessarily in terms of growth). This is why the SSD approach is used only to estimate an adequacy level of per student base funding and not additional spending via weights for special needs students.

Table 4.1
Initial Successful Schools Selection (110 Schools)

Performance Category	Elementary Schools	Middle Schools	High Schools	Total Schools
Selected Schools				
Schools by Level	64	29	17	110
Percent by Level	59%	26%	15%	100%
High-Performing	57	25	17	99
High-Growth	7	4	0	11
Average Enrollment	515	828	1,567	760
Average FRPM	18%	15%	9%	14%
Average LEP	8%	2%	1%	4%
Average Special Education	9%	8%	7%	8%
All Schools In Maryland				
Schools by Level	867	227	252	1,346
Percent by Level	64%	17%	19%	100%
Average Enrollment	498	729	1,116	637
Average FRPM	52%	40%	38%	46%
Average LEP	11%	5%	4%	8%
Average Special Education	11%	11%	10%	11%

Table 4.2
Comparison of Revised and Initial Successful Schools Selections

Performance Category	Elementary Schools	Middle Schools	High Schools	Total Schools
Selected Schools – Initial Selection (110 Schools)				
Schools by Level	64	29	17	110
Percent by Level	59%	26%	15%	100%
High-Performing	57	25	17	99
High-Growth	7	4	0	11
Average Enrollment	515	828	1,567	760
Average FRPM	18%	15%	9%	14%
Average LEP	8%	2%	1%	4%
Average Special Education	9%	8%	7%	8%
Selected Schools – Revised for PARCC (71 Schools)				
Schools by Level	46	19	6	71
Percent by Level	65%	27%	8%	100%
Average Enrollment	538	739	1,617	683
Average FRPM	21%	19%	7%	17%
Average LEP	9%	3%	0.5%	6%
Average Special Education	8%	8%	7%	8%

Incorporating the average of the first two statewide administrations of PARCC assessments as part of the school selection criteria resulted in eliminating 39 schools from the successful schools selection. Nineteen of these schools were elementary schools, 10 middle schools, and 11 high schools. The

number of districts represented decreased from 15 to 11. The resulting selection consisted of 46 elementary schools, 19 middle schools, and six high schools. As the table above shows, the overall selection of successful schools using PARCC data has somewhat larger average enrollment (except for middle schools) but remains very similar in terms of the concentration of students with special needs.

Table 4.3 presents the final list of 71 schools selected for the SSD expenditure analysis.

Table 4.3
Revised List of Successful Schools Included in Cost Analysis (71 Schools)

District Number	District Name	School Number	School Name
High-Performing Schools			
02	Anne Arundel	2052	Arnold Elementary
02	Anne Arundel	2092	Cape St. Claire Elementary
02	Anne Arundel	3082	Crofton Woods Elementary
02	Anne Arundel	4122	Davidsonville Elementary
02	Anne Arundel	2102	Folger McKinsey Elementary
02	Anne Arundel	2152	Jones Elementary
02	Anne Arundel	2372	Windsor Farm Elementary
02	Anne Arundel	2243	Magothy River Middle
02	Anne Arundel	2413	Severn River Middle
02	Anne Arundel	2013	Severna Park High
03	Baltimore County	0916	Cromwell Valley Elementary Technology
03	Baltimore County	1104	Kingsville Elementary
03	Baltimore County	0803	Lutherville Laboratory
03	Baltimore County	0811	Pinewood Elementary
03	Baltimore County	0907	Rodgers Forge Elementary
03	Baltimore County	0701	Seventh District Elementary
03	Baltimore County	0905	Stoneleigh Elementary
03	Baltimore County	0310	Summit Park Elementary
03	Baltimore County	0805	Timonium Elementary
03	Baltimore County	0772	Hereford High
04	Calvert	0312	Mount Harmony Elementary
04	Calvert	0315	Northern Middle
04	Calvert	0216	Plum Point Middle
06	Carroll	0406	Mechanicsville Elementary
06	Carroll	0509	Piney Ridge Elementary
06	Carroll	1306	Mount Airy Middle
06	Carroll	0508	Oklahoma Road Middle
06	Carroll	0504	Sykesville Middle
10	Frederick	1604	Myersville Elementary
10	Frederick	0311	Middletown Middle
10	Frederick	0714	Windsor Knolls Middle

District Number	District Name	School Number	School Name
13	Howard	0406	Bushy Park Elementary
13	Howard	0606	Hammond Elementary
13	Howard	0208	Northfield Elementary
13	Howard	0523	Pointers Run Elementary
13	Howard	0306	Triadelphia Ridge Elementary
13	Howard	0215	Waverly Elementary
13	Howard	0213	Worthington Elementary
13	Howard	0521	Clarksville Middle
13	Howard	0405	Glenwood Middle
13	Howard	0526	Lime Kiln Middle
13	Howard	0509	Atholton High
13	Howard	0404	Glenelg High
13	Howard	0203	Howard High
15	Montgomery	0420	Bannockburn Elementary
15	Montgomery	0226	Beverly Farms Elementary
15	Montgomery	0410	Bradley Hills Elementary
15	Montgomery	0511	Cashell Elementary
15	Montgomery	0351	Darnestown Elementary
15	Montgomery	0209	Lakewood Elementary
15	Montgomery	0601	Potomac Elementary
15	Montgomery	0405	Somerset Elementary
15	Montgomery	0408	Westbrook Elementary
15	Montgomery	0422	Wyngate Elementary
15	Montgomery	0413	North Bethesda Middle
15	Montgomery	0412	Westland Middle
15	Montgomery	0234	Thomas S. Wootton High
23	Worcester	1001	Ocean City Elementary
23	Worcester	0312	Showell Elementary
23	Worcester	0308	Stephen Decatur Middle
High-Growth Schools			
05	Caroline	0802	Colonel Richardson Middle School
10	Frederick	0204	Lincoln Elementary
15	Montgomery	0333	Benjamin Banneker Middle
15	Montgomery	0812	Parkland Middle
16	Prince George's	1709	Chillum Elementary
16	Prince George's	1725	Cool Spring Elementary
16	Prince George's	1214	Glassmanor Elementary
16	Prince George's	1408	Glenn Dale Elementary
16	Prince George's	1712	Lewisdale Elementary
16	Prince George's	2007	Woodridge Elementary
19	Somerset	1303	Somerset 6/7 Intermediate School

Collection and Analysis of School Level Expenditure Data

Once the high-performing schools were identified, the research team worked to collect expenditure data on the selected schools. Because MSDE only collects spending data at the district level, rather than at the school-level, the research team developed a school expenditure data collection tool similar to the one used in APA's earlier study for the Thornton Commission. This Microsoft Excel-based school expenditure data collection workbook was sent to each district from which a school was selected. In districts with more than one school selected, a data collection workbook was issued for each selected school. The data collection tools and detailed instructions were emailed to the districts' chief financial officers in early February 2016 and completed data collection tools were returned in early March.

The data collection tool is designed to gather general data on schools and districts and on five specific functional expenditure areas. These consist of:

1. **General information:** This section of the tool collects information on a school's grade span and enrollment, district enrollment, and teacher characteristics at the school and district levels.
2. **District administration:** This area collects information on central office staffing levels and on expenditures for district administration, including general, centralized and business support services, and instructional program administration and supervision. These data will be used to determine overall district administration costs, which can then be allocated to schools on a per pupil basis.
3. **School administration:** This area collects information on staffing and cost data for the office of the principal, including principals and assistant principals; clerical staff; and office supplies, equipment and contracted services.⁴⁰
4. **School instruction:** This section gathers data on the costs of a school's instructional programs. These data include the number of staff and associated costs for instructional and instructional support staff, textbooks and other instructional materials and equipment.

⁴⁰ Maryland's *Financial Reporting Manual for Maryland Public Schools* defines the central office functions included under District Administration as follows:

General Support Services: Activities concerned with establishing and administering policy for district operations, including the Board of Education and the office of the superintendent.

Centralized Support Services: Activities that support each of the other instructional and supporting services programs, including planning, research, development, and evaluation services.

Business Support Services: Activities concerned with paying, transporting, exchanging, and maintaining goods and services for the district, including budget, financial accounting, payroll, and internal auditing.

Instructional Administration and Supervision: Activities that support instruction and assist instructional staff in planning, developing, and evaluating the process of providing learning experiences for students.

5. Other school costs: This section of the tool is used to collect all other school-based costs such as operations and maintenance, student personnel and health services, and community services.

The MSDE staff provided an initial vetting of the draft data collection tool. Following this review, the research team met with district budget administrators in October 2015 to obtain direct feedback from the administrators who would be completing the data collection tool. The research team explored whether the use of technology, such as a web-based survey tool, would facilitate the collection of data from the large number of schools included in the study, but the district budget administrators who reviewed the tool felt that the Excel workbooks would be easier to use.⁴¹ Of the 111 data collection tools sent out to districts, 110 were returned (the one exception being the very high-needs school that was withdrawn from the study).

Determining a Per Pupil Base Cost

After the school-level expenditure data had been collected, the research team compiled the data in a Microsoft Excel database for analysis. Because the SSD approach is used only for determining an adequate per pupil base cost, spending on programs for students with special needs are specifically excluded from the analysis. To facilitate comparability of data across districts and schools, the categorization of expenditure data was standardized across the participating schools and a weighted average base cost per pupil⁴² was calculated for each school level — elementary, middle, and high school. From these, a single base cost per pupil was derived that is weighted by the distribution of students across the three levels of schooling.

Data Verification

To ensure the accuracy of the expenditure data reported on the data collection tool, the research team compared the data reported in the data collection tool to each school's district expenditures, looking for inconsistencies between the school- and district-reported expenditure data. Enrollment and staffing counts were also compared to data provided by MSDE school-level reports. In cases where a school's reported data differed significantly from the comparison data, the research team contacted the district to verify or correct the data.

Application of Efficiency Screens

The final step in the school selection process was a check on the fiscal efficiency of each selected school. For this study, a relative measure of efficiency was used; that is, schools with spending significantly higher or lower than the average for all of the selected schools were eliminated from the cost analysis for the area or areas where they were outside the norm. The purpose of the efficiency screen is to avoid

⁴¹ The text of the data collection tool instructions and expenditure tool worksheets sent to district budget administrators are shown in Appendix D.

⁴² The purpose of calculating a weighted average per pupil base cost is to prevent outlier schools, such as a very small school with high per pupil spending, from unduly influencing the average base cost. The weighted average per pupil base cost is calculated by multiplying school enrollment by the base cost for each school included in the study, summing the result, and then dividing this by the total enrollment of all schools in the study.

biasing the base cost estimate by removing schools that are either very inefficient or unusually efficient in the use of their resources. Efficiency screens were applied separately to:

- The school's per pupil costs, both personnel and non-personnel, for instruction;
- the school's per pupil costs, both personnel and non-personnel, for administration; and
- the school's per pupil costs, both personnel and non-personnel, for operations and maintenance functions.

Only the expenditures from the functional areas for which a school was within the acceptable efficiency range (instruction, administration, or operations and maintenance) were included in the spending analysis. For example, a school whose expenditures for administration and operations and maintenance were outside of the acceptable efficiency range would only have its expenditures for instruction included in the expenditure analysis. A school whose expenditures in all three functional areas were within the acceptable efficiency range would be included in all three areas of the analysis.

The acceptable efficiency range for each area was set at 1.5 standard deviations above to 2.0 standard deviations below the mean for all selected schools; schools above or below this efficiency range in each expenditure area were excluded from the analysis for that expenditure area. This efficiency range was established based on analyses of school expenditures in several states and are intended to exclude only extreme outliers. In excluding these schools, thus excluding schools whose level of efficiency is well outside the norm of other schools, the research team avoided bias in its creation of a per pupil base cost estimate.

A total of 27 schools out of the original 110 did not meet the criteria for one or more of the efficiency measures. Only one school failed to meet the criteria for two of the measures and no schools failed to meet the criteria for all three measures. The following number of schools were outside the acceptable efficiency range in each area: 10 schools for instructional expenditures, nine schools for administration expenditures, and eight schools for per pupil operations and maintenance expenditures. One school was outside the acceptable efficiency range for both instruction and administration expenditures. As a result, the expenditures for these schools were removed from the spending analysis for the relevant functional area.

Successful Schools/School District Approach Base Cost Estimates

Using expenditure data from the initial 110 schools, adjusted for efficiency, resulted in a per student base figure of \$8,700. This base figure is the estimate of the average spending per student for the regular education program provided to all students in a school along with per student allocations of central office administrative support in the areas of general support services, business support services, centralized support services, and instructional administration and supervision. The estimate excluded spending for all programs targeted to students with special needs, such as compensatory education (including the State's compensatory education grants and federal Title I funding), LEP, and special education. Table 4.4 illustrates per student expenditures for the initial group of 110 schools by school-level disaggregated by the three major functional areas of administration (both the allocated portion of

district administration and school administration), instruction, and other expenditures. For this set of schools, the highest average per student spending is at the high school level and the lowest in elementary schools. Administration and other school expenditures account for 16 percent of total spending each, while school instruction accounts for 68 percent.

Table 4.4
Successful Schools Expenditures Per Pupil (110 Schools)

Performance Category	Elementary Schools	Middle Schools	High Schools	Total Schools
Administration (District and School)	\$1,402	\$1,375	\$1,396	\$1,401
School Instruction	\$5,782	\$5,886	\$6,179	\$5,915
Other School Expenditures	\$1,343	\$1,291	\$1,413	\$1,380
Total Expenditures	\$8,527	\$8,552	\$8,988	\$8,700

There was relatively little change in the per student base cost estimate after recalculating the base using the 71 schools remaining after accounting for performance on the PARCC. The base cost increased slightly to \$8,716 per student.

Table 4.5 shows the breakout of spending in the final group of 71 schools by functional area. The expenditures by functional area are very similar to those of the 110 schools with the exception of high schools, from which the most schools were dropped when performance on PARCC was included. The remaining high schools are higher spending overall than the larger group of high schools among the 110 schools, but the smaller number of schools had little impact on the overall base cost estimate. School instruction still comprises the largest share of per pupil spending across all schools, totaling 69 percent of total spending. Total administration (both district central office and school) accounts for 16 percent of total spending, and other school expenditures for 15 percent. Per student spending in all three of the functional areas is greatest in high schools. Elementary schools had the lowest per pupil expenditures for instruction, while middle schools spent the least per pupil for total administration and other school expenditures.

Table 4.5
Successful Schools Expenditures Per Pupil (71 Schools)

Performance Category	Elementary Schools	Middle Schools	High Schools	Total Schools
Administration (District and School)	\$1,407	\$1,375	\$1,487	\$1,406
School Instruction	\$5,815	\$6,010	\$6,627	\$5,963
Other School Expenditures	\$1,340	\$1,298	\$1,567	\$1,347
Total Expenditures	\$8,561	\$8,683	\$9,680	\$8,716

V. Reconciling Adequacy Approaches

This chapter of the report examines how the study team used the results of the three approaches — evidence-based (EB), professional judgment (PJ), and successful schools/school districts (SSD) — to identify a single adequacy recommendation that includes a base cost figure and adjustments for special needs students, including special education, LEP, and compensatory education (at risk) students, as well as an adjustment for prekindergarten students. Each of the three approaches uses a different method to examine adequacy, as fully described in the previous chapters, and provides independent data points.

Table 5.1 briefly summarizes the three adequacy approaches:

Table 5.1
Summary of Three Approaches to Adequacy

	Evidence-Based	Professional Judgment	Successful Schools/Districts
Benchmark of Success	Ensuring students can meet all state standards	Ensuring students can meet all state standards	Currently outperforming other Maryland schools
Data Source	Best practice research, reviewed by Maryland educators; when conflict arises in resource recommendations, the EB approach defers to the research	Expertise of Maryland educators serving on PJ panels; uses research as a starting point but defers to educators when conflict arises in resource recommendations	2014-15 expenditure data from selected successful schools
Available Data Points			
Base	Yes	Yes	Yes
Student Adjustments (Weights)	Yes	Yes	No

In brief review, the EB approach examines available best practice research to create a base adequacy model and then convenes a series of panels with educators to ensure that students can meet all state specific standards with the resources identified by research. The approach defers to the available research when conflicts arise between the research and the panels. The EB approach identifies base spending as well as additional weights for students with special needs.

Similar to the EB approach, the PJ approach identifies the resources needed to meet all state standards. It also begins with evidence-based research but relies on and defers to the experience of the state’s educators to finalize the model based on the resources their professional experiences and judgments suggest are needed to ensure student success. The PJ approach also identifies both a base cost and special needs adjustments.

In contrast, the SSD approach examines the spending of schools currently outperforming other schools in the State. As such, it is a good representation of the resources needed to perform well in comparison to other schools, but not necessarily what it would take for a school and its students to meet all state requirements. The SSD approach is only able to look at the base spending amount for a student with no additional needs, due to limitations on collecting special need student expenditure data. Finally, the SSD approach does not provide the study team with detailed information on the types of programs or interventions being employed by the schools.

Developing a Blended Base Cost Figure

Table 5.2 shows the resulting base figures from the three approaches and compares them to the 2014-15 base used in Maryland’s funding system.

**Table 5.2
Base from Each Study Approach, Compared to 2014-15 Maryland Base**

	2014-15 Maryland	Successful Schools/Districts	Evidence-Based	Professional Judgment
Base Cost	\$6,860	\$8,716	\$10,551	\$11,607

As shown, the base cost figures identified by the three approaches are all higher than the state’s current 2014-15 base cost figure of \$6,860. The three figures vary from a low of \$8,716 for the SSD approach to a high \$11,607 for the PJ approach.

The analysis utilized all three approaches to allow the study team to understand the differences in base costs associated with meeting each of the three benchmarks of success described in Table 5.1. In some other states, the results for the SSD and PJ approaches have been similar. In Maryland, the three base cost data points show larger variation between the SSD results and the EB and PJ results. To identify a single base cost figure from the three approaches, the study team first needed to identify the benchmark of success to be used.

The study team felt that the best benchmark of success to develop a single adequacy figure in Maryland would be to identify what it would take not just to outperform other schools today, but to reach the higher benchmark of being able to ensure all students can achieve all current state standards. During the duration of the study, PARCC data was released for two school years, and the results of the tests statewide and for the SSD schools reinforced the differences between current success and meeting all state standards. Therefore, the study team recommends that a final adequacy base cost figure be derived from the EB and PJ approaches.

While the study team does not believe the SSD figure fully represents the cost of adequacy in Maryland, it does present an important reference point for the work. It shows the base resources necessary for schools to reach a higher level of achievement than current performance, and therefore the study team believes that the SSD figure could be used during the phasing in of a new funding system.

The study team needed to then determine how to reconcile the base cost figures from the EB and PJ approaches. As noted in Table 5.2 and detailed in Chapters II and III, the two approaches produced relatively similar base cost figures — the EB base is \$10,551 and the PJ base is \$11,607. The study team then undertook an analysis of the resources identified by each approach to reconcile the key differences that produced these differing figures to come up with a final, blended adequacy base figure.

Addressing Key Resource Differences between EB and PJ Approaches

In its review of the EB and PJ resource models, the study team identified five important areas of resource differences between the two approaches:

1. Elementary school teacher-to-student ratios.
2. Middle school teacher preparation time.
3. School administration staffing, specifically assistant principals.
4. School-level student support services.
5. Inclusion of CTE resources in the models.

The study team reviewed the resource differences and made a recommendation in each area to create an adjusted model for each approach. It is important to note that the study team was not attempting to create a specific model for implementation but instead was reconciling the largest resource differences in order to create a single cost estimate. Table 5.3 provides more detail on these differences.

**Table 5.3
Key Resource Differences in Base across the EB and PJ Approaches**

	Evidenced-Based	Professional Judgment	Blended Model Recommendation
Elementary School Teacher Ratios (grades four and five)	25:1	20:1	25:1
Middle School Planning and Collaboration Time	25%	30%	25%
School Administrator Positions—Assistant Principals (AP)	E/S-0 AP per 450 students M/S-1 AP per 720 students H/S-3 AP per 1,200 students	E/S-2 AP per 450 students M/S-3 AP per 720 students H/S-4 AP per 1,200 students	E/S-1 AP per 450 students M/S-2 AP per 720 students H/S-3 AP per 1,200 students
School-Level Student Support Positions	2.0	3.8	3.0
CTE	Not included in Base	Included in Base	Included in Base

Elementary School Teacher Ratios

Both models had the same classroom student-teacher ratios in kindergarten through grade three but differed in grades four and five. Given that teacher staffing is the largest cost driver in both models, the study team addressed this difference first. The EB identifies a student-teacher ratio of 25:1 while the PJ identifies a ratio of 20:1 in grade four and five. The team deferred to the available best practice research and used the 25:1 ratio in grades four and five, since additional teaching staff are added on top of the base once student need is taken into consideration.

Middle School Planning and Collaboration Time

The second difference was the amount of time allocated for planning, collaboration, and professional development for middle-school teachers during the school day, represented as a percentage of the day. The PJ participants identified a modified block schedule that provided this time, with teachers teaching in classrooms 70 percent of the day. The EB approach had a block schedule with four 90-minute periods, where a teacher would teach for three blocks and have one block as preparation time, resulting in teachers teaching 75 percent of the day. Given that common planning and professional development time are key components of any successful school, as was stressed repeatedly by panelists in both approaches, the study team felt that meaningful time during the day to allow for these activities was needed to meet state standards. The study team recommends the slightly more conservative estimate from the EB approach with teachers teaching 75 percent of the day and 25 percent of the day set aside for planning and collaboration activities. This still represents a significant portion of the day but is more in line with the teaching percentages at the elementary and high school levels in both the PJ and EB models.

School Administrator Positions

The third difference was the number of school administrators, specifically assistant principals. The PJ and EBPJ panels both mentioned the need for additional administrative time to ensure proper evaluation of teaching staff and to provide time for instructional leadership. The two models, however, differed in how this feedback was used. The PJ approach deferred to the experience of educators, with panels identifying the need for two assistant principals per 450 students in elementary schools, three assistant principals per 720 students in middle schools, and four assistant principals per 1,200 students in high schools. The EB approach deferred to the available research (which is limited regarding the impact of additional administrative staff) and retained its original recommendation of no assistant principals per 450 students in elementary schools, one assistant principal per 720 students in middle schools, and three assistant principals per 1,200 students in high schools. The study team felt that while the research may not suggest the need for additional assistant principals at all levels, given the state's requirements around educator evaluations and panelists' strong opinions about the importance of the positions, each model was adjusted to include one assistant principal in the elementary school, two assistant principals in the middle school, and three assistant principals in the high school.

Student Support Services Positions

The next key area of difference was school-level student support services, positions such as nurses, counselors, social workers, and psychologists, at the elementary level. Both the EBPJ and PJ panelists identified a significant need for student support resources, even at the base level. The actual number of staff recommended varied between the two approaches, with the PJ approach recommending 3.8 student support staff positions and the EB model instead recommending 2.0 student support staff positions. The study team settled on three student support staff positions at the elementary level as a compromise between PJ and EB recommendations to adequately meet student needs; this would allow for one nurse and two counselors, or a different configuration of the positions that would work best for a school site (such as a social worker instead of one of the counselors).

CTE Expenditures

Finally, the PJ study included CTE expenditures in the base while the EB study kept CTE as a separate per student amount. The study team decided that given that CTE is not a separate component of the current funding system, these resources should be a part of the base and adjusted the EB model accordingly.

Adjustments in these key resource areas reduced the difference between the EB and PJ base figures to less than \$100, so the study team did not further reconcile smaller resource differences. By blending the resulting figures from the two approaches, the study team produced a final adequacy base of \$10,970. The study team feels this amount appropriately reflects the best estimate of the level of resources needed for students to meet state standards.

Developing Weights

Once the single blended adequacy base figure was developed, the study team next needed to identify a single set of weights. As mentioned earlier, the SSD approach only provides an estimate for base expenditures and is not designed to determine weights for special needs students, so the study team relied on the results of the EB and PJ approaches. Table 5.4 presents the weights from the two approaches, using the blended base of \$10,970; these weights will vary from those presented in Chapters II and III, since a new base figure is used. Weights were calculated for the three categories of special needs students (compensatory education, special education, and LEP), as well as for prekindergarten students. PJ weights shown are the average figures across concentration levels, or need categories.

Table 5.4
Weights Determined by the EB and PJ Approaches, Using the Blended Model Base

	Compensatory Education Weight	Special Education Weight*	LEP Weight	Prekindergarten Weight
Evidence-Based	0.29	0.70	0.37	0.36
Professional Judgment, (Average)	0.39 ⁴³	1.25 ⁴⁴	0.64 ⁴⁵	0.33

**Note that the Evidence-Based special education weight presented is only for mild and moderate special education students, while the PJ weight includes mild, moderate and severe special education students.*

For all but the prekindergarten weight, the weights derived from the PJ approach were higher than those from the EB approach. As noted, the weights for special education are not perfectly comparable figures, a difference that will be subsequently addressed. In most instances, the study team did not try to reconcile specific resources when determining weights as approaches to serving students with special needs varied widely between EB and PJ. Instead the team compared the resulting weights (calculated against the blended base), reviewed panel recommendations, case study information, and data on student performance to determine a blended weight, then benchmarked the weight against weights from other adequacy studies conducted nationally since Maryland’s prior study.

Compensatory Education

The results from the EB and PJ approaches were similar, with an EB weight of 0.29 and an averaged PJ weight across the three concentration levels of 0.39. The EB weight did not include the resources for an alternative school (instead the resources for an alternative school were kept as a separate categorical) while the PJ weight did; if these resources were instead included the EB weight would be 0.31.

Given the results of the study team’s analysis of student assessment performance in Maryland, coupled with panel discussions that often emphasized the significant instructional and support resources needed to serve these students, the study team felt that the PJ panel weight was a better estimate of the additional resources required to provide compensatory education students with the services they need to meet state standards. Therefore, the study team decided on a rounded 0.40 weight for compensatory education students.

This weight is within the range of weights seen in other adequacy studies since 2002, which ranged from 0.24 to 0.75, as shown in Table 5.5.

⁴³ Average weight from three concentration levels: 2 percent Concentration: 0.35; 50 percent concentration: 0.46; and 75 percent Concentration: 0.36

⁴⁴ Combined weight weighted by the proportion of special education students in each category: mild: 0.87; moderate: 1.43; severe: 3.86

⁴⁵ Average weight from three concentration levels: 7 percent concentration: 0.83; 20 percent concentration: 0.69; and 60 percent concentration: 0.42

Table 5.5
Weights from Other State Adequacy Studies

State	Year	At Risk Weight
Colorado	2003	0.26- 0.56 (based on district size)
Colorado	2006	0.26- 0.56 (based on district size)
Colorado	2011	0.35
Colorado	2013	0.35
Connecticut	2005	0.28-0.62 (based on concentration)
D.C.	2013	0.37
Kentucky	2004	0.49-0.59
Minnesota	2006	0.75
Montana	2007	0.27-0.50 (based on district size)
Nevada	2006	0.29-0.35 (based on district size)
Pennsylvania	2007	0.43
South Dakota	2006	0.24-0.72 (based on district size)
Tennessee	2004	0.25

Special Education

The PJ study recommended a higher weight of 1.25 than the EB study’s weight of 0.70. This is primarily because the EB study assumes high cost special education student services were to be fully paid for by the State, which results in their exclusion from the approach’s 0.70 weight. Alternatively, the PJ study includes these students in the calculation of its 1.25 weight. If the EB model included the high-cost special education students, then the resulting weight would be higher. Using the 3.86 weight for severe special education students from the PJ approach, and the same weighting based upon the proportion of students in each need category as was done to create the average PJ weight, an EB weight that includes these higher cost students would be 0.96. Averaging the EB and PJ weight produces a weight of 1.11. Knowing that meaningful achievement gaps exist for these students, the study team recommends a rounded weight of 1.10 for special education students, including mild, moderate, and severe categories.

This figure is also in line with the average special education weights from the study team’s national adequacy study review as shown in Table 5.6.

Table 5.6
Special Education Weights from Other State Adequacy Studies

State	Year	Special Education Weight
Colorado	2003	1.15
Colorado	2006	1.15
Colorado	2011	0.93 for mild; 1.93 for moderate; 5.2 for severe
Colorado	2013	0.93 for mild; 1.93 for moderate; 5.2 for severe
Connecticut	2005	0.987 for mild; 1.540 for moderate; 4.182 for severe
D.C.	2013	Level 1: .88; Level 2: 1.08; Level 3: 1.77; Level 4: 3.13
Kentucky	2004	1.23
Minnesota	2006	1.0
Montana	2007	0.77 for mild; 1.32 for moderate; 2.93 for severe
Nevada	2006	0.88 for mild; 1.28 for moderate; 2.52 for severe
Pennsylvania	2007	1.3
South Dakota	2006	0.94 for mild, 1.86 for moderate; 4.21 for severe
Tennessee	2004	0.5 for mild; 1 for moderate; 3.45 for severe

LEP

The weights for LEP from the EB and the PJ approaches are very different. The EB weight is 0.37, with 0.07 to address language services and 0.30 to provide support services. The EB model also uses an unduplicated count; that is, LEP students who are also eligible for the compensatory education weight only receive the LEP weight. The PJ model identifies an average weight of 0.64 to address both the instructional and support service needs of LEP students. The PJ model also applies the compensatory weight to LEP students who meet the income criteria, meaning a student who is low-income and identified as a LEP would receive both the compensatory education and the LEP weight.

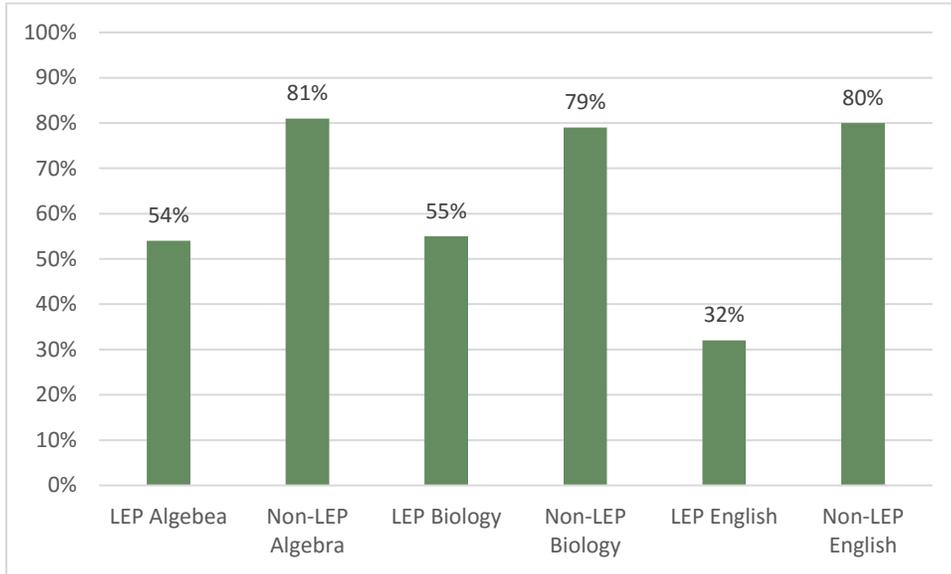
To determine the appropriate blended weight, the study team first looked deeper into the resource allocations in the two models. The study team determined that support services needed for LEP students, as identified in the two approaches, were very similar to the services needed for compensatory education students, and in fact many of LEP students qualify for both programs. Therefore, the study team believes a weight of 0.40 would be appropriate to meet the support service needs for the LEP population outside of the specific language needs.

Next, looking specifically at the resources provided in each model to address student instructional needs, the study team found that the two models had very disparate recommendations, with the EB model recommending an LEP student-to-staff ratio of 100:1, and the PJ model recommending about 15:1. The case studies indicated that staff-to-student ratio from the PJ approach was a lower ratio than what is currently being utilized in successful schools, while the EB ratio was much higher.

The study team’s analysis of student assessment performance indicates that there are significant achievement gaps for LEP students, even higher than that of other student populations; LEP students on

the Maryland High School assessment score on average 24 percentage points below their non-LEP peers in biology, 48 percentage points below in English, and 27 percentage points in algebra.

Figure 5.1
Achievement Gaps for LEP Students



Based on this information, the study team determined that an adequate level of funding for language services would need to be closer to the estimates from the PJ approach to better address these persistent performance gaps. Therefore, the study team recommends a 0.40 weight to address the language needs of LEP students.

Students who are both LEP and eligible for compensatory education would also receive the compensatory education weight of 0.40 for necessary support services, for a combined weight of 0.80.

This weight is within the range of LEP weights available from other states' adequacy studies nationally as shown in Table 5.7.

Table 5.7
LEP Weights from Other State Adequacy Studies

State	Year	LEP Weight
Colorado	2013	0.47-0.56 (based on district size)
Connecticut	2005	0.76
D.C.	2013	0.60
Maryland	2001	1.0
Minnesota	2006	0.90
Montana	2007	0.50-0.82 (based on district size)
Nevada	2006	0.47-1.21 (based on district size)
Pennsylvania	2007	0.75
South Dakota	2006	0.39-1.18 (based on district size)
Tennessee	2004	0.60-0.90 (based on district size)

Prekindergarten

Lastly, the study team recommends a weight of 0.35 for prekindergarten students. The EB and the PJ weights using the blended base cost were similar with an EB weight of 0.36 and a PJ weight of 0.33. Each weight represents the greater resource needs associated with serving prekindergarten students, primarily due to the staffing requirements mandated by regulations. Both models recommend one teacher and one instructional aide per 15 students, which is more significant classroom staffing than at any other grade-level (15:1 kindergarten to grade three or 25:1 grade four through grade 12 without an aide). Although the EB model recommends providing prekindergarten services for both three and four-year-olds, the return on investment analysis from the study team’s prekindergarten study and PJ work led to a final recommendation of providing a program only for four-year-olds at this time. The EB weight is a per student weight and the reduction in students served does not change the EB prekindergarten weight.

All compensatory education and special education-eligible prekindergarten students would receive the compensatory education weight and the special education weight in addition to this prekindergarten weight. Based upon feedback from the PJ panels, the study team believes applying the LEP weight to prekindergarten students would be unnecessary, as all students at this age are engaged in language acquisition.

Adjusting for Federal Funds

The above base and weights establish the amounts of resources needed per student from combined federal, state, and local funding sources. The federal government provides Maryland with financial resources for special education students, LEP students, economically disadvantaged students, early childhood services, teacher development, and other programs and services. The study team calculated the portion of the base and weights that the State and districts would be responsible to fund net of these federally support dollars. The base amount funded net of federal funds is lowered from \$10,970 to

\$10,880. The special education, LEP, compensatory education, and prekindergarten weights become 0.91, 0.35, 0.35, and 0.29, respectively.

Table 5.8
Final Adequacy Base and Weights after Adjusting for Federal Funds

	Blended Model	Final Adjusted
Base Cost	\$10,970	\$10,880
Weights		
Special Education	1.10	0.91
Compensatory Education	0.40	0.35
LEP	0.40	0.35
Prekindergarten	0.35	0.29

These final adjusted adequacy figures will be used in the remainder of the report.

VI. Formula Recommendations and Implementation

Utilizing the information gathered during the past two years of the study, the study team developed recommendations for a revised school-funding formula for the State of Maryland. This chapter will be structured as follows:

- 1. Summary of previously released reports.** The first section of this chapter will summarize the 13 reports produced to date for this study.
- 2. Recommendations.** The second section of this chapter will detail the decisions made in creating the final formula recommendations. For each decision, the study team will discuss both the information from the current study used to inform the decision and address differences from Maryland’s current funding approach.
- 3. Comparison to current funding.** The third section of this chapter will examine the district and state-level impacts of the recommended formula. This includes examining differences in total funding, funding per student, and state and local shares.
- 4. Comparison to prior adequacy study results.** The fourth section of this chapter will compare adequacy-cost estimates from the current study to the prior study for context.
- 5. Considerations for phase-in.** The final section of this chapter examines approaches to phasing in the adequacy recommendations.

Summary of Previously Released Reports

The adequacy recommendation detailed below was informed by 13 studies conducted prior to this final report. This section briefly describes the reports produced for each of these studies. The reports range from research summaries to final impact analyses and provide detailed research methodologies,

findings, and recommendations. Specifically, three of the reports focus on school size and two center on enrollment trends and prekindergarten. The remaining studies involve aspects of school finance equity, such as concentrations of poverty and the geographic cost of education. PDFs of the full reports are available on the Maryland State Department of Education's website. The links to these reports and suggested citations for each can be found in Appendix A.

Below is a summary of each report in chronological order:

A Comprehensive Review of State Adequacy Studies Since 2003 (September 2014)

The purpose of this review is to provide Maryland policy makers with information on how other adequacy studies were conducted, what the estimated adequate funding levels were, and where definitive information exists, the policy impact the studies had in these states.

Summary of School Size Report (September 2014)

This report is the first of three required school size reports. The report addresses three questions: 1) whether local Maryland school systems currently have policies regarding the size of schools; 2) the role of the public in determining school size policies; and 3) other states' policies and best practices regarding school size. The report also provides an initial summary of the research regarding school size and the educational issues affected by school size.

Proposed Methodology for Establishing Adequate Funding Levels in the State of Maryland (December 2014)

This report describes the approach the research team and its partners proposed to estimate a per student base funding level and per student weights for those students with special needs such as an impoverished background, LEP, and cognitive or physical disabilities. The report describes the study team's approach as presented in its proposed methodology to the MSDE, input on that approach received since work began on the study, and the study team's proposed changes to its approach.

Preliminary Report on the Impact of School Size (January 2015)

The second of three required school size reports, this *Preliminary Report on the Impact of School Size* serves four purposes: 1) extends the findings from the literature review on the impacts of smaller schools on student achievement, efficiency, and school climate contained in the first report; 2) identifies models for establishing smaller schools as presented in the literature; 3) describes currently available state programs for supporting school facility construction in Maryland; and 4) outlines the remaining analyses to be presented in the final school size report.

Adequacy Cost Study: An Interim Report on Methodology and Progress (July 2015)

The *Adequacy Cost Study* report provides a comprehensive description of the progress made on the adequacy study's components found in Section 3.2.1 of the State's RFP. The report begins with an overview of the adequacy study requirements outlined in the RFP, followed by an outline of the research team's specific approach to determining adequacy. The report then gives a description of the work required for each of the adequacy study's components, a description of the work already

underway or completed, a description of the work still to be started, and a timeline for the completion of the work.

Evaluation of the Use of Free and Reduced-Price Meal Eligibility as a Proxy for Identifying Economically Disadvantaged Students: Alternative Measures and Recommendations (July 2015)

This evaluation describes the approach the research team and its partners took to evaluate the use of free and reduced-price meal eligibility as a proxy for identifying economically disadvantaged students, including the consideration of alternative measures of economic disadvantages, for calculating compensatory aid. More specifically, it describes the indicators of economic disadvantage currently being used by state school funding formulas across the nation, including how states are addressing the changes in the collection of family income data as a result of the Community Eligibility Provision (CEP) of the Healthy, Hunger-Free Kids Act of 2010, and it simulates the effects on school district shares of state counts of economically disadvantaged students for nine different proxies. The report concludes with a discussion of the tradeoffs associated with each model.

Final School Size Study Report: Impact of Smaller Schools (July 2015)

Following the first two reports on the impacts of school size, this third and final report presents the analyses and findings from the first two school size reports along with the concluding analyses and findings of the school size study. This report examines the impacts of school size on student achievement and school operating costs; examines the relationship between school size and school climate; examines the relationship between school size and extracurricular participation; presents a review of factors influencing school size; proposes alternative methods for creating smaller learning environments; and discusses the potential impact of smaller school guidelines on Maryland's school construction funding programs. Finally, this report presents the research team's recommendations regarding school size.

Final Report of the Study of Increasing and Declining Enrollment in Maryland Public Schools (November 2015)

This report presents the findings of the study on increasing and decreasing enrollment. The scope of the study includes analysis of enrollment trends and their relationship to local school system characteristics, and transportation and operational costs. Transportation was singled out for additional study to evaluate the transportation costs in conjunction with the numbers and types of students served, operating characteristics, and state funding.

Geographic Cost of Education Adjustment for Maryland (November 2015)

Geographic Cost of Education Adjustment for Maryland evaluates the current Maryland geographic cost of education index (GCEI) and makes recommendations for possible revisions. This review provides information on the benefits and drawbacks of different methods that could be used to estimate geographic cost variations and recommends that Maryland adopt the comparable wage index method to replace its current GCEI. The objective of this review is to give policy makers the information necessary to determine the best approach for Maryland.

Analysis of School Finance Equity and Local Wealth Measures in Maryland (December 2015)

This examination provides an analysis of the equity of Maryland’s current school funding formulas and offers further analysis of alternative wealth measures for distribution of state aid to local school districts.

The Effects of Concentrations of Poverty on School Performance and School Resource Needs: A Literature Review (December 2015)

This literature review addresses the effects of concentrations of poverty on the research team’s adequacy recommendations. This report provides a review of the relevant literature related to the effects of poverty on both student- and school-level academic outcomes. This report also discusses whether there is evidence to support providing additional per student funding to districts with higher concentrations of poverty.

A Comprehensive Analysis of Prekindergarten in Maryland (January 2016)

As a comprehensive analysis of Maryland’s prekindergarten system, this report provides six components: 1) a detailed literature review on the benefits of prekindergarten; 2) an analysis of current prekindergarten capacity, enrollment, and quality distribution in Maryland; 3) an analysis of current prekindergarten funding in Maryland; 4) a comparative analysis of prekindergarten in Maryland and prekindergarten programs in 11 other states and the District of Columbia; 5) a cost-benefit analysis of universal prekindergarten in Maryland; and 6) a set of recommendations for Maryland as it continues to develop its prekindergarten programs.

A Comparable Wage Index for Maryland (July 2016)

This report briefly reviews the rationale for adjusting for variations in educational costs by geographic locations using a geographic cost of education index. It then estimates a comparable wage index (CWI) for Maryland based on the recommendation made in the earlier *Geographic Cost of Education Adjustment for Maryland* report.

Adequacy Study: Draft Final Report (September 2016)

The *Adequacy Study: Draft Final Report* presents the findings of the research team’s adequacy analysis for the State of Maryland. The research team’s estimate of the cost of an adequate education in Maryland used three approaches for estimating adequacy, the results of which were crafted into a single adequacy recommendation for the State. The research team also developed recommendations for a new funding formula incorporating its adequacy recommendation and a model to analyze the impacts of the proposed school funding formula on the State and on individual school districts.

Recommendations

The study teams’ recommendations result in a significant increase in the state’s investment in prekindergarten through grade 12 education. However, they also change the way in which funding is allocated through the funding formulas and the distribution of state and local shares across districts. Although implementing these recommendations will present some challenges, the recommendations reflect the professional judgment of educators across the State, the findings of a wide range of research

literature, and are consistent with the results of numerous adequacy studies conducted across the country over the past decade. The study team believes these changes are necessary for Maryland's students to significantly increase their performance on the new state standards and assessments. In the first year of statewide administration of the PARCC assessments, an average of 57 percent of students met or exceeded proficiency in math and 65 percent of students met or exceeded proficiency in reading. The changes to the formula recommended here are geared toward increasing the number of students meeting these new, higher standards. Other factors also drive the need for these changes, such as the increased costs of the State's new educator evaluation system, the need for more extensive student supports for all students, and improved funding equity.

The study team thinks of the recommended formula in two parts. The first part is the calculation of district adequacy targets. This includes determining: (1) the student counts that are used, (2) the base amount of funding per pupil, (3) the adjustments for special needs students (including special education, compensatory education, and LEP students), and (4) any adjustment for regional cost of living differences. The calculation of an adequacy target is done outside any considerations of the state and local responsibilities to pay for the adequacy target.

The second part of the formula revision focuses on the state and local shares for paying for the adequacy target. Recommendations include: (5) how to measure each district's capacity to pay for the adequacy target, and (6) if any minimum state aid guarantees should be included and whether local jurisdictions should be required to appropriate the local share of special needs programs. Combining the adequacy targets with the calculation of funding sources allows the study team to compare the current funding system to the recommended system.

Calculating District Adequacy Targets

To calculate a district's total adequacy target, regardless of the state or local share, student counts are multiplied by the base cost and special needs adjustments and then adjusted for regional cost differences. The decisions for each of these key components of calculating adequacy targets are described below.

Student Counts

The study team recommends changes to current student count methods for: 1) addressing declining enrollments for general education formulas; 2) counting low-income students for compensatory total program; and 3) including prekindergarten students in the state's full-time equivalent enrollment counts to provide universal prekindergarten services.

The study team recommends retaining the same general student count methods used for the current formulas, including total FTE enrollment, compensatory education students, LEP students, special education students, and prekindergarten students. Our recommendations for addressing declining enrollment, counting compensatory education students, and counting prekindergarten students are presented below.

Declining Enrollment

The study team recommends including a declining enrollment calculation when calculating total enrollment for each district. Currently, total enrollment is based on the September 30 FTE enrollment count for the prior school year. The November 2015 *Final Report of the Study of Increasing and Declining Enrollment in Maryland schools* discusses the reasoning for a declining enrollment adjustment. Generally speaking, as a district loses enrollment, it can't necessarily reduce costs in a linear fashion to the loss of students. The proposed methodology would use three years of enrollment information in the calculation of the total enrollment figure, allowing districts to absorb the loss of funding related to the loss of students over time. A district would receive the greater of two counts — the prior year's enrollment count or the average of the three prior years' counts. The calculation ensures that districts with growing enrollments receive funding based on the most recent enrollment count. Table D.1 in Appendix D shows the effect on enrollment numbers and funding by using the greater of a single year or a three-year rolling average or just implementing a single year count. The recommended method increases student enrollment in 10 of the 24 districts. Also, the proposed enrollment count results in higher total funding by \$11,468,199 compared to using the single year enrollment count.

Counting Low-Income Students

The issue of how to best count low-income students was raised as a result of the growing use of the Community Eligibility Provision (CEP) included in the 2010 Healthy, Hunger-Free Kids Act (HHFKA), which allows eligible,⁴⁶ participating schools to serve free meals to all of its students. In a move to reduce reporting burdens on schools, the law prohibits participating schools from collecting application forms for the federal free and reduced-price lunch program during the four-year CEP eligibility period, which results in incomplete district and statewide FRPM counts.

In July 2015 the study team released the report entitled *Evaluation of the Use of Free- and Reduced-Price Meal Eligibility as a Proxy for Identifying Economically Disadvantaged Students: Alternative Measures and Recommendations*. The report examined the various options for identifying students for compensatory education funding. It attempted to identify the best count for compensatory education generally and with a focus on the potential impact of CEP program, which would suspend FRPM counts in eligible schools for up to four years. The implication of CEP is that students no longer need to complete the federal form required to qualify for FRPM in these schools, creating an undercount of FRPM students and, in turn, an undercount of low-income students.

The report discusses the impact of this provision on student counts. The study team recommends using either of two alternatives from the various approaches examined in the report. The first alternative, which is the preferred approach, is to continue to use FRPM eligibility to identify students for compensatory education funding but use an alternative state-developed form for collecting FRPM eligibility information. The second of the two alternative recommendations relies on direct certification

⁴⁶ Schools are eligible for CEP if 40 percent or more of its students have been identified as being vulnerable to hunger during the spring of the prior school year. Among the factors that may be used to identify children are homelessness, placement in foster care, participation in Head Start, migrant status, and living in households receiving services from the SNAP, FDPIR, or TANF programs.

of students eligible for programs such as the Supplemental Nutritional Assistance Program (SNAP), Transitional Assistance for Needy Families (TANF), or Medicaid using existing administrative data from state and local social services agencies.⁴⁷ However, the statewide direct certification count is much lower than the current FRPM count, about 56 percent of the FRPM count, and would result in significantly less compensatory education funding. An adjustment factor could be applied to the direct certification count to generate a statewide eligibility count comparable to the current FRPM count, but counts at the district-level would still vary significantly from current counts. Due to this redistribution in the compensatory education eligibility counts, any implementation of direct certification should be phased-in over time. The study team recommends using the first alternative, in which the State creates an alternative form for collecting FRPL eligibility information because this approach will continue to provide a comprehensive count while minimizing the redistribution of counts across districts.

Counting Prekindergarten Students

Maryland currently provides funding for prekindergarten students who meet specific qualifying criteria related to the income of the child's family. In the January 2016 report entitled *A Comprehensive Analysis of Prekindergarten in Maryland*, the study team identified the need to expand the coverage and the quality of prekindergarten services in the state to ensure students would be prepared to meet the MCCRS. The report recommends a goal of providing high-quality prekindergarten for all four-year-old children. Though offered to all families, it is expected that no more than 80 percent of families with four-year-old children will participate. To be eligible for state funding, four-year-old prekindergarten students must be enrolled in a "quality" program, which is defined as a program that is six and a half hours long and located in a public or private setting that: 1) has earned an EXCELS⁴⁸ rating of level 5, 2) has earned state or national accreditation (for example, accreditation through the National Association for the Education of Young Children), or 3) is a public school program which must, at a minimum, meet EXCELS level 5 standards.

In September 2013, the total public prekindergarten enrollment reported by local school districts was 29,724. After adjusting the school district figures to convert half-day programs to their full-day equivalent, the number of full-day public program spaces available in the State is 26,631. In addition, most, though not all, districts have private EXCELS Level 5 and accredited programs within their boundaries. This adds 1,607 EXCELS Level 5 full-time slots and 4,413 accredited full-time slots that are eligible for funding. This approach would recognize 32,651 prekindergarten slots as being eligible for funding through the foundation formula, which is the funding method recommended by the study team. This represents an increase of 2,927 eligible prekindergarten students in the State from the September 2013 enrollment count, or approximately 60 percent of all four-year-olds. In the modeling below, the study team uses the 32,651 count of "high-quality" slots for use in the foundation formula. This count is expected to grow over time up to 80 percent of all four-year-old children as more Level 5 slots become

⁴⁷ The recommendation suggests including eligibility for Medicaid or the Children's Health Insurance Program among the criteria used for determining eligibility if the direct certification method is chosen.

⁴⁸ Maryland uses a Quality Rating and Improvement System (QRIS) called EXCELS to accredit prekindergarten providers.

available.⁴⁹ Appendix D Table D.2 shows the effect of using prekindergarten students in the student count. Including these prekindergarten students in the FTE enrollment count increases the count to 867,174 students (877,707 students when applying the 0.29 weight).

Though the study team does not recommend implementing a prekindergarten program for three-year-olds at this time, the study team was asked to develop an estimate of the cost of providing high-quality prekindergarten services to low-income three-year-olds. That estimate is presented in Appendix E in the supplemental document *Appendices A-E: Final Report of the Study of Adequacy of Funding for Education in Maryland*.

Base Cost

The base cost figure of a formula should be designed to represent the resources a student with no special needs in a district with no special circumstances needs to meet state standards. The base cost includes resources for instructional, administrative, and other costs associated with meeting student needs. Maryland's standards and requirements have changed over time and the base cost needs to keep up with these changes to ensure all students, schools, and districts have the resources needed to meet the new standards. As was mentioned in Chapters II-IV, the study team identified three base cost figures from the various adequacy approaches. The base cost figures from the evidence-based approach (EB) and professional judgment approach (PJ) were determined to best estimate the resources needed for all students to meet the MCCRS. The three adequacy study approaches were reconciled in Chapter V to create a final base cost recommendation based upon blending the EB and PJ approaches. This new base cost, once federal dollars were considered, was \$10,880. For comparison, the current base cost used for the 2014-15 foundation program was \$6,860.

This difference between the recommended base cost (\$10,880) and the current base cost (\$6,860) is substantial and represents a greater focus on providing resources at the base level to all students (instead of through adjustments tied to student need) than in the previous adequacy work done for the Thornton Commission, from which the current base figure is derived. The professional judgment panelists and the extensive research reviews of the EB and PJ approaches strongly argued for a larger base amount for several reasons. First, the new College and Career Ready State standards and other state requirements are more rigorous than those in place at the time of the first study. Stronger accountability systems at both the state and federal levels also place higher stakes on adequately supporting students to meet these standards. The professional judgment panelists and research literature also indicated that most, if not all, students are coming to school with greater needs, requiring more support services even if they have not been formally identified as at risk, LEP, or special education.

⁴⁹ The rate at which existing slots for prekindergarten students are converted to EXCELS Level 5 or its equivalent is limited by the number of prekindergarten programs that earn and move to EXCELS Level 5. To meet the goal of 80 percent of Maryland four-year-olds being served in a Level 5 program, the objective would be to have the capacity to serve approximately 60,300 four-year-olds in high-quality programs. This figure is approximately 27,650 higher than the 32,651 slots that are available today. The study team included the 32,651 figure in the recommendation estimate. The study team elected to use the lower count in recognition that it will take several more years before the number of "high quality" EXCELS Level 5 slots become available to accommodate 80 percent of four-year-olds.

Further, since 2002 there are additional requirements for schools and districts, such as educator evaluations that require additional resources to accomplish.

While the study team does not intend to be prescriptive in how resources should be used, the base figure reflects the resource level needed to enable schools to provide the following key resources to meet the higher state standards and requirements, shown in Table 6.1.

**Table 6.1
Base Cost Components**

Key Resources in the Development of the Base Figure
Small class sizes
Staffing to support (but not limited to) the following areas: art, music, PE, world languages, technology, CTE, and advanced courses
Significant time for teacher planning, collaboration, and imbedded professional development
Additional instructional staff including instructional coaches, and librarian/media specialists
High level of student support, such as counselors, nurses, behavior specialists, or social workers, for <u>all</u> students
Administrative staff to allow for instructional leadership, data-based decision making, and evaluation
Technology rich learning environments, resourced at a level that would allow for one-to-one student devices
Resources for instructional supplies and materials, assessment, textbooks, and student activities
District-level personnel and other resources to support schools

Weights

Student adjustments, or weights, are designed to provide the additional resources these students need above the base cost to ensure they can meet state standards. The study team is recommending the following student need adjustments for compensatory education, LEP, special education, and prekindergarten students as shown in Table 6.2:

Table 6.2
Recommended Weights

Student Category	Weight
Compensatory Education	0.35
LEP	0.35
Special Education	0.91
Prekindergarten	0.29

The recommended compensatory education and LEP weights, both 0.35, are lower than the current weights. This is reflective of the shift to providing additional resources in the base instead of through adjustments tied to student need as discussed above. These weights were set at the level needed to raise sufficient funding when applied to the higher base to fund the additional staff and non-staff resources identified in the PJ and EB studies as necessary to adequately serve these students. The lower weights also reflect that all students, including students at risk of academic failure and students with limited English proficiency, will receive a higher level of services through the general education program due to the higher base amount. Further, both weights are recommended to be linear, that is, the weights remain constant regardless of the concentration of these students. In this final chapter of this report addressing additional studies, a discussion on funding for higher concentrations of low-income students is included. This section goes into detail on the research related to funding for concentrations of poverty and the basis for the study team’s recommendation of funding compensatory education on a linear basis. It builds on the December 2015 report *The Effects of Concentrations of Poverty on School Performance and School Resource Needs: A Literature Review*. The study team recommends that regardless of a district’s percentage of compensatory education students, all eligible students receive the 0.35 weight. Districts with higher concentrations would receive more funding overall, but not more on a per student basis.

The study team concludes that at this time the evidence is not compelling to justify nonlinear funding mechanisms,⁵⁰ even though the challenges that high-poverty schools face are readily observed. Neither the research literature nor the results from the PJ and EB studies indicate a need for a nonlinear approach. The research team believes that given the level of funding recommended by this study, Maryland’s schools would have the necessary resources for services to meet state standards, such as the supplemental strategies highlighted in the *Concentrations of Poverty* report and those highlighted in the EB and PJ approach sections of this report such as prekindergarten, summer school, after-school programs, arts education, and the coordination of wrap-around services through the use of school-based community liaisons to address the needs of these students.

⁵⁰ Under a nonlinear weighting approach, a higher weight would be applied to districts (or schools) with higher concentrations of students in poverty. Under this approach districts with higher concentrations of students in poverty would receive more funding per eligible student than districts with lower concentrations. Under a linear weighting approach, all students receive the same weighting (and amount of additional funding) regardless of poverty concentrations.

Second, the study team recommends that the State continue to use a single weight for special education students. The recommended weight is 0.91, which is higher than the current weight of 0.74. The proposed weight both reflects the level of services identified by the PJ and EB studies and is in-line with recommendations made in recent adequacy studies for other states as presented in the *A Comprehensive Review of State Adequacy Studies Since 2003* report.⁵¹

Finally, the study team proposes a prekindergarten weight of 0.29 to fund quality prekindergarten programs for four-year-olds. The 0.29 weighting is needed to pay for the additional costs of high-quality programs. The primary cost drivers are related to staff, including higher total compensation packages required to attract and retain early childhood education certified teachers and credentialed program administrators, a small instructor-to-student ratio of one certified teacher and assistant (or two certified teachers) per 15 students, a 6.5 hour program day, planning time and ongoing professional development for staff, and time to conduct routine child screenings and assessments.

At a participation rate of 80 percent of all four-year-olds, the study team estimated a total cost of \$439.6 million with state aid accounting for 51 percent of total costs on average and local appropriations accounting for the remaining 49 percent of costs. Contributions from families based on their income is an option for offsetting part of these costs. However, the study team estimated that the State would accrue a return on investment of \$5.54 for each dollar spent through reduced special education and remedial program spending in grades kindergarten through 12 and lower criminal justice and child welfare system costs.⁵²

Though the recommended weights may be lower than the current weights in some cases, it does not necessarily mean special needs students would receive fewer resources for two reasons. One reason is that the weights are applied to a higher recommended base. Another reason is that current weights may not be fully funded at present, as only the state share of funding for these weights is guaranteed. The study team recommends that the recommended weights from this study be fully funded. A detailed comparison of per student amounts generated under both current and recommended bases and weights will be provided later in this chapter.

One final recommendation regarding weights, the study team recommends a student receive all weights for which they are eligible, with the exception of LEP weights for prekindergarten students. As described in Chapter V, the study team believes applying the LEP weight to prekindergarten students would be unnecessary, as all students at this age are engaged in language acquisition.

Regional Cost Adjustment

Regional cost adjustments are applied to funding targets to account for geographical differences in the costs faced by districts across the State. There are few states that take a similar approach to Maryland's current GCEI, Alaska and Wyoming being two examples, while most states with cost of living indices,

⁵¹ See Aportela, A., Picus, L., Odden, A. & Fermanich, M. (2014). *A Comprehensive Review of State Adequacy Studies Since 2003*. Denver, CO: Augenblick, Palaich & Associates.

⁵² For more information on prekindergarten costs and return on investment, see Workman, S., Palaich, R., & Wool, S. (2016, January). *A Comprehensive Analysis of Prekindergarten in Maryland*. Denver, CO: APA Consulting.

such as Massachusetts, Missouri, New York, Virginia, and Florida, use wage indices.⁵³ For example, the school funding formula in Missouri includes a Dollar Value Modifier (DVM) which is an index of the relative purchasing power of a district in order to provide additional funds to districts with higher costs-of-living. Missouri's DVM is calculated based upon the ratio of a regional average wage per job in relation to the state's median wage per job and is applied to a district's weighted average daily attendance multiplied by the state adequacy target.⁵⁴ Similarly, New York uses a Regional Cost Index (RCI) to reflect regional variations in purchasing power around the state, based on wages of non-school professionals.⁵⁵ New York's RCI is applied to a district's foundation funding amount.

Two reports were produced examining regional cost adjustments for the Maryland school funding model. In November 2015, the *Geographic Cost of Education Adjustment for Maryland* report examined the current approach used by the State, the GCEI, and the alternative approaches available for adjusting for regional cost differences. The report recommended switching from the GCEI to a Comparable Wage Index (CWI) approach for regional cost adjustments to better account for the differences in costs faced by districts in Maryland. The June 2016 report *A Comparable Wage Index for Maryland* calculated the CWI figure for each school district in the State.

As a result, the study team is recommending using the CWI figure to adjust for regional cost differences. The study team recommends all formula funds be adjusted by the CWI, which is a further change from the current funding system. Currently, only foundation funding is adjusted by the GCEI. However, regional differences in costs impact all program areas, not only programs supported by foundation funding. Additionally, the study team also recommends that adjustments be made for districts with CWI figures above and below the statewide average. Currently, adjustments are made only for those districts with GCEI figures above the state average, providing for additional funding for districts in regions with higher than average costs. By not applying GCEI figures below the state average, funding for districts in lower cost regions is not reduced, resulting in a financial advantage for these districts in the competition for attracting and retaining qualified staff. Finally, the study team recommends that the CWI adjustment be applied prior to determining the state and local shares. Currently, the GCEI adjustment is made after the local share has been calculated and the entire cost of the GCEI adjustment is included in state foundation aid. However, under this recommendation the full range of the CWI will be applied (both above and below the state average), therefore local jurisdictions should share in any savings as well as extra costs resulting from the application of the CWI.

In Appendix D Table D.3A shows the effect on the total program amount (without the guaranteed tax base (GTB) and transportation) with a regional adjustment using CWI compared to no regional adjustment. Total funding in 12 of the 24 districts would be lower with the adjustment, with the largest decrease being 19 percent. However, 11 districts would have an increase in funding using the CWI, with the largest increase being 17 percent. The use of the CWI as a regional adjustment to all formula funds

⁵³ Silverstein, J., Brown, A., Fermanich, M. (2015). Review of Alaska's School Funding Program. Denver, CO. Augenblick, Palaich, and Associates.

⁵⁴ *id.*

⁵⁵ *id.*

would increase funding by \$1.0 billion compared to using no regional adjustment. Table D.3b shows the State and local shares of the cost of the CWI.

Determining State and Local Funding

Equalized state funding systems determine state and local funding based on the wealth of each district, the required local share, any additional adjustments such as minimum aid guarantees or guaranteed tax bases, and the ability of districts to raise dollars above the foundation formula. This section examines each of the study team's recommendations for these components.

Local Wealth

The study team examined three issues related to determining the local wealth of districts: 1) the choice of using September or November net taxable income (NTI), whichever provided the largest amount of state aid, when determining local wealth; 2) the method for combining local, assessed property values and NTI; and 3) whether all or a portion of the tax increment of tax increment financing (TIF) districts should be exempted from the local property wealth portion of a district's wealth for school aid formula purposes. All three of these issues are presented in more detail in the December 2015 report *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. The study team provided recommendation on the issues of NTI and the method used for combining assessed property values and NTI but did not make a specific recommendation related to tax increment financing.

Net Taxable Income

Currently, MSDE calculates each funding formula impacted by local wealth using both the September and November NTI. Districts receive the calculation that results in the largest amount of state aid. The study team believes that the November NTI provides the more accurate measure of NTI, and hence the fiscal capacity of each district, because it includes a larger proportion of a county's income tax returns, including those filed closer to the extension deadline of October 15. Thus, the study team recommends using only the November NTI data for determining local wealth.

Combining Assessed Property Values and NTI

Maryland, along with five other states (Connecticut, Massachusetts, New Jersey, New York, and Virginia), includes both property and income wealth in its measure of local wealth to reflect the fact that the State's local jurisdictions raise revenues through both property and income taxes. Including a measure of income when determining local wealth also enables the State to more directly account for taxpayers' ability to pay — an important factor in local tax and spending decisions (Mankiw, 1998) and improving the funding system's equity. The study team's earlier equity analysis⁵⁶ showed that although Maryland's school finance system is quite equitable, high-wealth jurisdictions still generally spend more

⁵⁶ See Glenn, W. J., Griffith, M., Picus, L.O., & Odden, A. (2015). *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. Denver, CO: APA Consulting.

per pupil than lower-wealth jurisdictions, an indication that the finance system is not entirely fiscally neutral.⁵⁷

The State's current method of combining assessable property values and NTI, the measure of income used in determining local wealth, is to add the two components together. However, adding NTI to assessable property values may not fully account for the effects of differences in NTI across jurisdictions. For example, the effect of the income measure could be overwhelmed by a much larger property wealth amount. To help ensure that the effect of variation in NTI across jurisdictions is fully accounted for, the study team recommends that the State consider using a multiplicative approach instead of the current additive approach for combining the two measures of wealth. Under the multiplicative approach, each county's assessed property wealth is adjusted by multiplying it by the ratio of the jurisdiction's NTI to the state average NTI. In essence, under this approach, assessed property wealth is adjusted by an income index to account for differences in jurisdictions' NTI.

Moving to the multiplicative approach helps to increase the equity and fairness of the State's school finance system by ensuring the use of NTI in the local wealth calculation works to the benefit of lower-wealth jurisdictions. One of the basic tenets of a fair taxation system is the ability to afford the tax (Institute on Taxation and Economic Policy, 2011, Oates & Schwab, 2004). Under the current additive approach, the real and personal property assessable value component comprises between 60 percent and 90 percent of total local wealth. However, possessing high assessable property wealth does not necessarily mean a jurisdiction also has high taxable incomes. In Maryland there is only a moderate correlation between the two (0.58).⁵⁸ Studies also show that the property tax is regressive, with low-income families paying 3.6 percent of income in property taxes compared to 0.7 percent of income for high-income families (ITEP, 2015). The ability to pay property taxes may also change over time, for example seniors may find it difficult to pay the property taxes on their home once retired and living on a fixed income (Oates & Schwab, 2004). Some states, including Maryland, have attempted to address this by providing some property tax relief through an income-based circuit breaker (Lyons, Farkas, & Johnson, 2007).

The examples of Calvert County and Montgomery County help to illustrate how the multiplicative approach would change local wealth amounts. Calvert County's average assessable property wealth per student is almost equal to the state average at just over 100.0 percent. However, the county's November NTI per student is only 85.2 percent of the state average. Using the State's current additive method, the county's total November wealth measure is 94.9 percent of the state average. Using the multiplicative approach, Calvert County's November wealth measure would fall to 85.3 percent of the state average, resulting in an increase in its state share of funding. Under the current additive approach In Montgomery County, its wealth measure using November NTI is 42.5 percent above the state average. If the State adopted the multiplicative method, Montgomery County's total wealth measure

⁵⁷ In a fiscally neutral finance system there is no relationship between a jurisdiction's wealth and per pupil spending.

⁵⁸ The correlation between per pupil assessable property values and NTI is 0.58. On a per capita basis the correlation is 0.50.

would rise from 144.3 percent of the state average to 197.3 percent of the state average. This change would result in a significant decrease in state aid to Montgomery County and other districts that have incomes above the state average.

Table 6.3 compares measures of two important equity concepts for the proposed formula if wealth is determined using the multiplicative approach or if it is determined using the additive approach. The first is fiscal neutrality, the measure of the relationship between local wealth and education funding. Ideally, there should be little or no relationship between how wealthy a community is and the amount of money available to fund its schools. The second concept is equity, or how much variation in spending exists across local jurisdictions. An equitable school finance system should show minimal variation except for spending differences driven by student need.⁵⁹

Each of the equity statistics is calculated using two different student counts to examine two different ways of looking at equity. The first, labeled “Unweighted Enrollment,” uses the September 30th enrollment counts. The equity statistics using this count provide a measure of horizontal equity, or how equitable the finance system is without taking student need into account. The second, labeled “Weighted Enrollment,” uses the enrollment counts adjusted by the proposed weights for special need students. These statistics provide a measure of vertical equity, or how equitable the system is when accounting for differences in student need.

The table also includes benchmarks, or the generally accepted maximum value for each equity measure. The benchmark for fiscal neutrality should be no more than 0.50. This represents a moderate or lower positive relationship. The benchmark for equity should not exceed 0.10, a fairly low level of variation.

Table 6.3
Equity Statistics for Multiplicative and Additive Approaches
to Combining Assessed Property Value and NTI

	Benchmark	Multiplicative	Additive
Fiscal Neutrality			
Unweighted Enrollment	0.50	(0.32)	(0.20)
Weighted Enrollment	0.50	(0.19)	0.02
Equity			
Unweighted Enrollment	0.10	0.10	0.09
Weighted Enrollment	0.10	0.10	0.10

The table shows that for all measures both the multiplicative and additive approaches meet or exceed all benchmarks. There is essentially no difference in the equity measure whether using unweighted or

⁵⁹ Fiscal neutrality is measured by the correlation coefficient, a statistical measure of the relationship between per student local wealth and per student funding. The correlation coefficient may range from -1.0 (a perfect negative relationship) to 1.0 (a perfect positive relationship). Equity is measured by the coefficient of variation, a statistic that measures the amount of variation around the average for a set of values. The coefficient of variation typically ranges from 0.0 (no variation) to 1.0 (very high variation). An equitable school finance system should show minimal variation except for spending differences driven by student need.

weighted enrollment counts. The measure for fiscal neutrality, which would be expected to be impacted the most by a change in the way wealth is calculated, shows that both the additive and multiplicative approaches favor lower wealth jurisdictions (as demonstrated by a negative correlation between wealth and spending in both cases) when using unweighted enrollment counts. This means that the formula provides a somewhat larger state share to lower wealth jurisdictions than a perfectly neutral system. When weighted enrollment is used, the correlation of the additive approach becomes slightly positive (indicating a very small positive relationship between wealth and spending) while the correlation for the multiplicative approach remains negative. In sum, the multiplicative approach remains somewhat more favorable for lower wealth jurisdictions whether using unweighted or weighted enrollment.

Adopting the multiplicative approach would also result in an increase in the range between the lowest and highest wealth jurisdictions. Under the current additive approach, the range in per pupil wealth between the lowest wealth jurisdiction and highest wealth jurisdiction is \$830,870 per pupil. Under the multiplicative approach this range increases to just over \$1.1 million per pupil.

Adopting a multiplicative approach to combining measures of property wealth and income is not the only way to increase the effect differences in income have on total local wealth. Another alternative is to change the relative weight of the income measure to property wealth. Under the current additive approach in Maryland, NTI comprises 35 percent of total wealth on average. Three of the five other states that incorporate income in their local wealth measure (Massachusetts, New Jersey, and New York) weight income and property wealth so that each comprises 50 percent to the total wealth calculation. The remaining two states, Connecticut and Virginia, place less weight on income. Connecticut weights income as only 10 percent of total local wealth and Virginia weights income as 40 percent of the total. None of these states use the multiplicative approach to combining income and property wealth.

Table D.4 in Appendix D compares the proposed formula using the multiplicative approach to the proposed formula using the additive approach. The multiplicative approach results in the State providing a larger share of total funding in 19 of the 24 districts. Only one district would have an increase in local contribution of more than 30 percent if the multiplicative approach were used instead of the additive approach. The study team believes this recommendation will result in improved equity for the school finance system and improve the system's ability to take taxpayers' ability to pay into account when determining the distribution of state and local shares of state aid programs.

Minimum State Aid Guarantees and Local Shares of Special Needs Programs

Maryland's current funding programs provide minimum state funding guarantees in two ways. First, each district is guaranteed to receive at least 15 percent of its total foundation total program as state aid. Under the minimum foundation aid guarantee, a district with high local wealth may generate the full foundation total program through its local share but still receive at least 15 percent of the foundation total program in state aid, thus generating additional funding for the district or enabling the jurisdiction to reduce its local share in other program areas.

The second way in which state aid is guaranteed is by guaranteeing that all districts receive at least 40 percent of their special needs total program (compensatory education, LEP, and special education) as state aid. Further, districts are not required to provide a local share for any of these special needs program formulas. Again, under this minimum state aid guarantee, wealthier districts may reduce their local share amounts due to the guaranteed state aid, thereby increasing the cost of the program to the state and reducing or even eliminating any local effort. Further, providing the state aid minimums to wealthier districts and not requiring local shares of the special needs programs may be contributing to inequities identified in the formula in the study team's earlier school funding equity analysis.⁶⁰

The study team makes two recommendations concerning these issues. First, the minimum state aid guarantees should be eliminated for foundation and special needs funding programs. Eliminating the state aid minimums will free-up state funding dollars which could be used to provide additional support to those districts with lower local wealth and higher needs. Other states, including Colorado and Wyoming, take a similar approach. As of fiscal year 2009-10, Colorado eliminated its guarantee for minimum state aid with passage of House Bill 09-1318. Colorado's districts are no longer guaranteed to receive a minimum amount of aid from the state.⁶¹ Wyoming takes matters a step further than the study team's recommendation; the state does not provide a minimum funding amount, and, when local resources exceed the Foundation Guarantee amount, the excess is recaptured by the state from other aid programs.⁶²

Second, the study team recommends that all districts should be required to appropriate the full local share for all of the special needs funding programs. This change would both improve equity and ensure that districts are receiving the full funding amount identified by the adequacy study.

Under the study team's recommendation, a required local share would be calculated for each special needs (compensatory education, LEP, and special education) program using the same method as the foundation calculation. A total program amount, adjusted by the CWI, would be determined; an equalized local share determined; and a state share equaling the difference between the total program amount and the local share. The local share is equalized using the same method used for calculating the foundation local share, that is, by determining a statewide local contribution rate assuming the state average state and local shares are equal to 50 percent each.⁶³ The study team recognizes that this approach differs from the current method of equalization used with the special needs programs, but it elected to use the foundation program's method for two reasons. First, the study team's rationale for requiring a full local share for the special needs funding programs is to ensure that the full adequacy level of funding is provided to all students in every district – both students with and without special

⁶⁰ See Glenn, W. J., Griffith, M., Picus, L.O., & Odden, A. (2015). *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. Denver, CO: APA Consulting.

⁶¹ See Colorado Department of Education. *Understanding Colorado School Finance and Categorical Funding*. July 2016. <https://www.cde.state.co.us/cdefinance/fy2015-16brochure>

⁶² See State of Wyoming School Foundation Block Grant Flow Chart. March 2016.

<http://legisweb.state.wy.us/InterimCommittee/2016/SchoolFoundationBlockGrantFlowChart.pdf>

⁶³ The formula for determining the local contribution rate is: $(\text{total program} \times 0.50) / \text{total statewide local wealth}$.

needs. Second, by making the calculations for the foundation and special needs programs the same, the State could potentially streamline the formula by calculating the total program and state and local shares all within the foundation formula by using weighted student counts, i.e. taking the FTE enrollment count, calculating a weighted count by adjusting for the student need weights, and then multiplying by the foundation amount. A single local contribution rate could then be used to determine the state and local shares. Appendix D, Table D.5 shows the effects of no longer using minimum aid guarantees.

Under the proposed method of determining state and local shares, the State should also revise its maintenance of effort requirement, which requires each jurisdiction to appropriate the greater of its total foundation local share or its prior year per pupil total local appropriation. Because the proposed total required local share would consist of the foundation, compensatory education, LEP, and special education local shares, the maintenance of effort should be changed to the greater of the proposed total required local share or its prior year per pupil total local appropriation to make it consistent with the changes to the required local share.

Other State Funding Programs and Tax Increment Financing

There are several issues that the study team explored but for which specific recommendations were not made. These consist of transportation aid, the guaranteed Tax base (GTB) state aid program, and tax increment financing. In all three cases the study team determined there were insufficient research findings in the literature or examples of best practices from other states to support making a recommendation. However, the research team recognizes that these issues should be explored and recommends that the State continue to study these issues and develop recommendations in the future.

Transportation Aid

Transportation aid provides funding for the transportation of general education and disabled students to and from school. The current formula begins with a base amount equal to a district's prior year grant and is then adjusted for inflation and enrollment growth. The study team's recommendations would potentially impact the amount of transportation aid in two ways. First, the study team's recommendation to use the greater of the prior year's FTE enrollment or the average of the three prior years' FTE enrollment will result in higher enrollments in declining enrollment districts, thus providing more aid for these districts and increasing state costs. Second, the State must determine whether prekindergarten students will be transported via district transportation services, and if so, should prekindergarten counts be included in the enrollment counts used to adjust districts' base grant amount. It should be noted that the research team recommended that the transportation aid formula should be thoroughly studied to determine if an updated formula is warranted.⁶⁴

⁶⁴ See Hartman, W. & Schoch, R. (2015). *Final Report of the Study of Increasing and Declining Enrollment in Maryland Public Schools*. Denver, CO: APA Consulting.

Guaranteed Tax Base

The current GTB program was established to incentivize districts with less than 80 percent of the statewide average per pupil wealth to provide a larger local education appropriation. The GTB provides additional state aid for these districts based on two factors: 1) the amount of their local education appropriation in excess of their local foundation share; and 2) the ratio of their wealth per pupil to 80 percent of the statewide average wealth per pupil. Under the current system the GTB program is an important incentive for jurisdictions to provide a local appropriation for the special needs funding programs. Also, given the current low base funding amount, it aids lower wealth jurisdictions to provide an additional local appropriation to supplement their foundation total program funding. However, under the study team's recommendation that all jurisdictions provide a full local share of the special needs total program amounts, and with a new, adequate base funding amount, the State should examine whether the GTB should be continued in its present form and purpose.

Statutory Inflation Adjustment

In the current education funding formula the per pupil foundation amount is adjusted annually for inflation using the lesser of the Consumer Price Index for the Baltimore-Washington region, the implicit price deflator for state and local governments, or 5%. The study team did not make any specific recommendations for changing or eliminating the current inflation adjustment.

Tax Increment Financing

Tax increment financing (TIF) is an economic development tool that uses the growth in property values in a designated area to pay for some of the costs of redevelopment, for example the principle and interest of municipal bonds issued to pay for new infrastructure. Because the tax assessments on these properties are used for other purposes they are not available to support the general operations of local jurisdictions. In Maryland, the growth in property values in designated TIF areas are included in the calculation of property wealth for counties and the City of Baltimore, but these jurisdictions are not able to use the local tax revenues generated by these properties for education funding purposes. In several counties and the City of Baltimore this results in either a loss of education funding or higher tax assessments on other properties. The study team's analysis of the calculation of local wealth examined this issue and presented an example of how another state has dealt with this issue.⁶⁵ However, the study team does not offer a specific recommendation but instead suggests that the State continue to study this issue.

Table 6.4 provides a summary of the study team's recommendations compared to current practice in Maryland.

⁶⁵ See Glenn, W. J., Griffith, M., Picus, L.O., & Odden, A. (2015). *Analysis of School Finance Equity and Local Wealth Measures in Maryland*. Denver, CO: APA Consulting.

Table 6.4
Summary of Recommendations

Key Components of Formula	Currently Done in Maryland	Recommendation to Maryland
Student Counts		
Declining Enrollment	Total enrollment is based on the September 30 th FTE enrollment count for the prior school year.	A district would receive the greater of two counts – the prior year’s September 30 th enrollment count or the average of three prior year’s counts.
Counting Low-Income Students	Uses the FRPM eligibility form created by the federal government	Use a FRPM eligibility form that is created by the State and returned to the State
Counting Prekindergarten Students	Prekindergarten students who meet specific qualifying criteria related to the income of a child’s family.	Provide high-quality prekindergarten for up to 80 percent of eligible four-year-old students. In order to receive funding a student must be enrolled in a program that has earned a Level 5 EXCELS rating, has earned state or national accreditation, or is a public school program that reaches EXCELS level 4 standards.
Base Cost	\$6,860	\$10,880 - The recommended base has a greater focus on providing more resources at the base level to all students to meet higher state standards and requirements.
Weights		
Special Education	0.74	0.91
LEP	0.99	0.35
Compensatory	0.97	0.35
Prekindergarten	N/A	0.29
Regional Cost Adjustment	Uses the GCEI applied only to the foundation amount.	Uses the CWI, includes indices less than 1.0, and is applied to the foundation and all special needs total programs.
Local Wealth		
Net Taxable Income (NTI)	Districts receive the largest amount of state aid that results from using either the September or November NTI.	Recommends that the State only uses the November NTI data for determining local wealth.
Combining Assessed Property Values and NTI	Uses the additive approach by adding together both property and income wealth in its measure of a district’s local wealth.	Uses the multiplicative approach. Each district’s assessed property wealth is adjusted by multiplying it by the ratio of the district’s NTI to that the state average NTI.
Tax Incremental Financing (TIF)	The full value of designated TIF areas is included in the calculation of property wealth of local jurisdictions, but these jurisdictions are not able to use local tax revenue generated by these properties for education funding purposes.	No recommendation
Minimum State Aid Guarantees		
Foundation	Districts are guaranteed to receive at least 15 percent of the foundation total program in state aid.	Should be eliminated
Special Needs Programs	Districts are guaranteed to receive at least 40 percent of their special needs total program as state aid	Should be eliminated

Key Components of Formula	Currently Done in Maryland	Recommendation to Maryland
Transportation Aid	Has a base amount equal to a district's prior year grant and is then adjusted for inflation and enrollment growth.	No recommendation
Guaranteed Tax Base	Provides additional state aid for districts based on the amount of their local education appropriation in excess of local foundation share and the ratio of their wealth per pupil to 80 percent of the statewide average wealth per pupil.	No recommendation

Comparison to Current Funding System

This section compares the results of the proposed school finance formula with the current formula. The study team's adequacy recommendations would result in a significant additional investment in education by the State and some local jurisdictions. The recommendations would also result in some redistribution of resources across districts, even though all districts would experience an increase in funding. The comparisons presented in this section include the changes in total program, state and local share.

All data used for these comparisons, such as student enrollment; special needs student counts; local wealth; and current total program, state share, and local shares are based on FY 2015 numbers. All of the parameters for the proposed model parameters (e.g. base amount, weights for students with special needs, local wealth calculation, etc.) reflect the model as described earlier in this chapter. These parameters are summarized in Table 6.5. All of the proposed amounts, total program, state share, and local share, are CWI adjusted. Comparisons do not include the estimated impact on transportation funding or the GTB program. An estimate of the change in transportation funding was not included because the RFP does not include an analysis of transportation funding.⁶⁶ No estimate for the GTB program was included because the study team could not identify any research or best practices to support a particular formula design. Therefore, the study team recommends further study of both of these issues with state policy makers during implementation of the new state funding system.

⁶⁶ The final report of the study teams' analysis of the impact of increasing and declining enrollment includes a recommendation for reviewing and updating the State's transportation formula. See Hartman, W. & Schoch, R. (2015). *Final Report of the Study of Increasing and Declining Enrollment in Maryland Public Schools*. Denver, CO: Augenblick, Palaich & Associates.

Table 6.5
Settings for Proposed Funding System Model

Funding System Component	Setting
Base Amount	\$10,880
Weights	
Compensatory Education	0.35
LEP	0.35
Special Education	0.91
Prekindergarten	0.29
Type of Enrollment Count	Greater of the prior year's count or a three-year rolling average; includes prekindergarten
Compensatory Total Program Count	Alternative Form FRPM count, includes prekindergarten
Special Needs Total Program	Adjusted for regional cost differences
Minimum Aid Guarantees	None
Local Share	Required for all special needs programs. Amount of local share limited to no more than the Total Program amount
Regional Cost Adjustment	CWI
Wealth Calculations	Multiplicative with no limits

It is difficult to make a direct comparison between current local appropriations and the proposed local share for a number reasons. First, districts are not currently required to fully appropriate local funds identified for special needs students through the special education, LEP, and at risk funding streams. The proposed system requires full local appropriation for these funding streams. This means that though the expected local share for each special needs funding stream could be identified for the proposed system, there are not data available to compare for the current funding system by special needs population.

Second, the study team cannot predict how districts would react to the proposed requirements for local funding. Currently, many districts have local appropriations above the current systems full expected total program, for both state and local share. A comparison can be made to these local appropriations and the proposed system's local share requirement. The study team cannot predict if districts would continue to fund above the proposed total adequacy target in the future.

Given the limitations discussed above, this analysis presents the following comparisons of the proposed and current funding systems:

- The aggregated total program amounts for the foundation and special needs programs (compensatory education, LEP, and special education);
- the aggregated state share amounts for the foundation and special needs programs, and the aggregated proposed required local share for these programs and the current total local appropriation;
- the per pupil aggregated total program amounts for the foundation and special needs programs;

- the total program and state and local shares for the foundation program; and
- the total program and state shares for each of the compensatory education, LEP, and special education funding programs.

The total of the proposed and current total program amounts for the foundation, compensatory education, LEP, and special education programs is presented in Table 6.6a below. The amounts in this table do not include other state aid programs such as the student transportation, guaranteed tax base, or declining enrollment programs. Statewide, these total program amounts would increase by \$4.1 billion or 44 percent over the current system. While all districts experience an increase in total program, the changes from district to district range widely, from 12 percent in Allegany County to 66 percent in Howard County. The primary factor influencing this range of increases across districts is the move from a formula with a relatively low base amount and very high weights for special needs students to one with a higher base amount and smaller weights. The districts with the smallest change in total program (Allegany, Dorchester, and Garrett) are among those with higher concentrations of special needs students. The smaller increases for these higher-need districts stems from the current formula’s design that targets a very high level of resources to special needs students while the base amount failed to keep up with the State’s move to higher standards and the increase in instructional and support services required for the average student to succeed.

Table 6.6a
Comparison of Proposed and Current Total Program for Foundation
and Special Needs State Aid Programs

Local Unit	Total Program			
	Proposed	Current ¹	Change	Percent Change
Allegany	\$106,193,944	\$94,815,114	\$11,378,830	12%
Anne Arundel	\$1,161,936,991	\$754,152,021	\$407,784,970	54%
Baltimore City	\$1,449,109,710	\$1,109,971,769	\$339,137,941	31%
Baltimore	\$1,636,358,800	\$1,144,843,049	\$491,515,751	43%
Calvert	\$225,294,976	\$143,741,471	\$81,553,505	57%
Caroline	\$73,873,587	\$60,515,648	\$13,357,939	22%
Carroll	\$338,196,159	\$229,472,055	\$108,724,104	47%
Cecil	\$220,398,254	\$156,851,725	\$63,546,529	41%
Charles	\$370,978,635	\$249,066,672	\$121,911,963	49%
Dorchester	\$63,156,163	\$53,259,411	\$9,896,752	19%
Frederick	\$560,038,906	\$376,875,749	\$183,163,157	49%
Garrett	\$45,089,530	\$39,836,597	\$5,252,933	13%
Harford	\$550,008,571	\$355,544,275	\$194,464,296	55%
Howard	\$766,474,431	\$462,503,346	\$303,971,085	66%
Kent	\$28,665,436	\$22,209,538	\$6,455,898	29%
Montgomery	\$2,467,169,557	\$1,596,147,925	\$871,021,632	55%
Prince George's	\$2,110,671,451	\$1,533,545,698	\$577,125,753	38%

Total Program				
Local Unit	Proposed	Current ¹	Change	Percent Change
Queen Anne's	\$95,172,967	\$70,577,970	\$24,594,997	35%
St. Mary's	\$252,865,758	\$161,100,826	\$91,764,932	57%
Somerset	\$43,559,075	\$34,643,902	\$8,915,173	26%
Talbot	\$58,485,958	\$44,918,051	\$13,567,907	30%
Washington	\$300,346,598	\$235,047,396	\$65,299,202	28%
Wicomico	\$203,312,762	\$162,730,142	\$40,582,620	25%
Worcester	\$89,045,641	\$66,227,977	\$22,817,664	34%
Total State	\$13,216,403,859	\$9,158,598,327	\$4,057,805,532	44%

¹Current total program represents the program amount determined by the state aid formulas for the foundation, compensatory education, LEP, and special education programs. The actual funding received by a jurisdiction may differ depending on the amount of local share it elects to appropriate. These amounts exclude additional funding provided through the NTI adjustment grants.

Table 6.6b below shows the change in per pupil total program for the four funding programs. Statewide, the average per pupil increase is \$4,266 or 39 percent. Again, while all districts receive an increase, there is a significant range, from 5 percent in Allegany County to 61 percent in Howard County. Only two counties (Allegany and Garrett) receive an increase of less than 10 percent while five counties (Calvert, Harford, Howard, Montgomery, and St. Mary's) receive an increase of 50 percent or greater.

Table 6.6b
Comparison of Proposed and Current Total Program for Foundation and Special Needs State Aid Programs Per Student, Fiscal Year 2015

Total Program				
Local Unit	Proposed	Current ¹	Change	Percent Change
Allegany	\$12,000	\$11,405	\$595	5%
Anne Arundel	\$14,789	\$9,899	\$4,889	49%
Baltimore City	\$17,165	\$13,988	\$3,178	23%
Baltimore	\$15,115	\$10,970	\$4,144	38%
Calvert	\$13,873	\$9,084	\$4,789	53%
Caroline	\$13,339	\$11,560	\$1,780	15%
Carroll	\$12,801	\$8,843	\$3,958	45%
Cecil	\$14,003	\$10,388	\$3,616	35%
Charles	\$14,049	\$9,758	\$4,291	44%
Dorchester	\$13,395	\$11,822	\$1,572	13%
Frederick	\$13,757	\$9,548	\$4,209	44%
Garrett	\$11,434	\$10,523	\$910	9%
Harford	\$14,477	\$9,595	\$4,882	51%
Howard	\$14,397	\$8,958	\$5,439	61%

Total Program				
Local Unit	Proposed	Current ¹	Change	Percent Change
Kent	\$13,327	\$11,133	\$2,194	20%
Montgomery	\$16,197	\$10,824	\$5,373	50%
Prince George's	\$16,959	\$12,857	\$4,103	32%
Queen Anne's	\$12,313	\$9,446	\$2,867	30%
St. Mary's	\$14,269	\$9,538	\$4,731	50%
Somerset	\$14,588	\$12,704	\$1,884	15%
Talbot	\$12,650	\$10,450	\$2,200	21%
Washington	\$13,261	\$10,714	\$2,547	24%
Wicomico	\$13,765	\$11,682	\$2,082	18%
Worcester	\$13,239	\$10,598	\$2,641	25%
Total State	\$15,241	\$10,975	\$4,266	39%

¹Current total program represents the program amount determined by the state aid formulas for the foundation, compensatory education, LEP, and special education programs. The actual funding received by a jurisdiction may differ depending on the amount of local share it elects to appropriate. These amounts exclude additional funding provided through the NTI adjustment grants.

Table 6.7a compares the proposed state and local shares for the foundation, compensatory education, LEP, and special education programs to the current state share for these programs and jurisdictions' total local appropriation. The total local appropriation figures used in this comparison exclude the local appropriation for student transportation because the state shares used exclude state transportation aid. Comparing the proposed required local share to the current local appropriation is not a perfect "apples-to-apples" comparison because the proposed local shares do not include an estimate of any additional local appropriation a jurisdiction may choose to raise. However, it does provide an indication of how jurisdictions' local shares may change under the proposed system.

The results shown in Table 6.7a also show a wide range of changes across districts in state and local share. This is a result of several features of the proposed system, including the new method for calculating local wealth, the elimination of minimum state aid amounts, and the requirement that all jurisdictions raise the full local share of the three special needs programs. These changes, in addition to increases in total program amounts, lead to large increases in state aid, in the range of 80 percent or more, in Calvert, Charles, Harford, and St. Mary's counties. Three counties, Kent, Talbot, and Worcester, would lose all of their state aid due to the recommendations for required local shares, the elimination of minimum state aid amounts, and changes in the local wealth calculation.

Local wealth changes and requiring full local shares for the three special needs funding programs results in an increase in the local share in 10 counties, including Anne Arundel (44 percent), Baltimore (18 percent), Garrett (6 percent), Harford (7 percent), Kent (68 percent), Montgomery (60 percent), Queen Anne's (31 percent), St. Mary's (5 percent), Talbot (69 percent), and Worcester (20 percent). These compare to a statewide average increase of 19 percent. Several other counties are already raising local

appropriations well in excess of the proposed required local shares, including Allegany County, Baltimore City, Calvert County, Cecil County, Charles County, Dorchester County, Prince George's County, Somerset County, and Washington County.

Table 6.7b compares the total of the proposed state and local shares for the foundation, compensatory education, LEP, and special education programs, to the total of the current state share for these programs and jurisdictions' total local appropriation. Table 6.7c shows the same information on a per pupil basis. Again, this is not a perfect apples-to-apples comparison because the proposed local shares do not include any additional local appropriation jurisdictions may elect to contribute. This comparison shows that total state shares plus local appropriations statewide would increase by 29 percent. Potentially, this increase could be larger if jurisdictions make additional local appropriations above the proposed required local share. The difference between proposed and current range from increases of 30 percent or greater in Anne Arundel, Baltimore City, Baltimore, Caroline, Cecil, Harford, Prince George's, and St. Mary's counties. Worcester County is the only jurisdiction that would experience a decrease. However, Worcester County currently appropriates a significant amount of additional local funding in addition to what is required for the foundation local share. If the county continued providing additional local support above the proposed required local share the decrease would be reduced or eliminated.

As Table 6.7c shows, the statewide average increase would be 24 percent on a per pupil basis. The per pupil increase is less than the total dollar increase because the proposed student counts, which now include four-year-olds in the prekindergarten program, are larger. The per pupil differences range from increases of 38 percent in Harford and St. Mary's counties to a decrease of eight percent in Worcester County.

Table 6.7a
Comparison of Proposed and Current State Shares, Proposed Required Local Share, and Current Total Local Appropriation for Major State Aid Programs, Fiscal Year 2015

Local Unit	Total State Share				Total Local Share			
	Proposed ¹	Current ²	Change	Percent Change	Proposed Total Required Local Share ³	Current Total Local Appropriation ⁴	Change	Percent Change
Allegany	\$84,760,301	\$69,402,465	\$15,357,836	22%	\$21,433,643	\$27,803,239	(\$6,369,596)	(23%)
Anne Arundel	\$338,187,597	\$298,243,340	\$39,944,257	13%	\$823,749,394	\$574,019,440	\$249,729,954	44%
Baltimore City	\$1,255,260,400	\$868,410,977	\$386,849,423	45%	\$193,849,309	\$222,668,278	(\$28,818,969)	(13%)
Baltimore	\$805,808,718	\$543,936,097	\$261,872,621	48%	\$830,550,082	\$702,043,465	\$128,506,617	18%
Calvert	\$132,316,345	\$74,239,921	\$58,076,424	78%	\$92,978,632	\$107,464,664	(\$14,486,032)	(13%)
Caroline	\$62,256,061	\$44,843,482	\$17,412,579	39%	\$11,617,526	\$12,165,081	(\$547,555)	(5%)
Carroll	\$182,371,694	\$120,768,400	\$61,603,294	51%	\$155,824,465	\$160,009,414	(\$4,184,949)	(3%)
Cecil	\$160,424,468	\$93,494,559	\$66,929,909	72%	\$59,973,786	\$71,200,935	(\$11,227,149)	(16%)
Charles	\$263,859,425	\$148,176,358	\$115,683,067	78%	\$107,119,210	\$147,990,646	(\$40,871,436)	(28%)
Dorchester	\$48,221,525	\$33,872,151	\$14,349,374	42%	\$14,934,638	\$17,283,492	(\$2,348,854)	(14%)
Frederick	\$358,044,072	\$214,292,242	\$143,751,830	67%	\$201,994,834	\$226,057,530	(\$24,062,696)	(11%)
Garrett	\$17,831,996	\$16,372,428	\$1,459,568	9%	\$27,257,534	\$25,648,414	\$1,609,119	6%
Harford	\$329,614,473	\$183,761,510	\$145,852,963	79%	\$220,394,097	\$205,619,903	\$14,774,194	7%
Howard	\$284,723,521	\$200,955,246	\$83,768,275	42%	\$481,750,910	\$509,476,046	(\$27,725,136)	(5%)
Kent	\$0	\$7,038,633	(\$7,038,633)	(100%)	\$28,665,436	\$17,083,590	\$11,581,846	68%
Montgomery	\$210,685,890	\$564,924,312	(\$354,238,422)	(63%)	\$2,256,483,667	\$1,414,198,324	\$842,285,342	60%
Prince George's	\$1,616,734,015	\$938,783,546	\$677,950,469	72%	\$493,937,436	\$571,471,671	(\$77,534,235)	(14%)
Queen Anne's	\$31,948,463	\$29,340,617	\$2,607,846	9%	\$63,224,504	\$48,258,017	\$14,966,487	31%
St. Mary's	\$162,528,290	\$89,393,070	\$73,135,220	82%	\$90,337,468	\$85,808,913	\$4,528,555	5%
Somerset	\$37,756,339	\$25,425,381	\$12,330,958	48%	\$5,802,736	\$8,546,617	(\$2,743,880)	(32%)
Talbot	\$0	\$10,595,400	(\$10,595,400)	(100%)	\$58,485,958	\$34,608,537	\$23,877,421	69%
Washington	\$228,453,419	\$155,626,289	\$72,827,130	47%	\$71,893,179	\$90,022,201	(\$18,129,022)	(20%)

Local Unit	Total State Share				Total Local Share			
	Proposed ¹	Current ²	Change	Percent Change	Proposed Total Required Local Share ³	Current Total Local Appropriation ⁴	Change	Percent Change
Wicomico	\$170,557,795	\$121,959,193	\$48,598,602	40%	\$32,754,966	\$37,385,077	(\$4,630,111)	(12%)
Worcester	\$0	\$15,774,211	(\$15,774,211)	(100%)	\$89,045,641	\$74,211,757	\$14,833,884	20%
Total State	\$6,782,344,808	\$4,869,629,829	\$1,912,714,978	39%	\$6,434,059,051	\$5,391,045,250	\$1,043,013,801	19%

¹Proposed state share is the amount for the foundation, compensatory education, LEP, and special education programs.

²Current state share includes the foundation, compensatory education, LEP, special education, GCEI, guaranteed tax base, supplemental grant, NTI adjustment, and declining enrollment state aid programs. It excludes student transportation grants and the State share of teachers' retirement costs.

³Proposed total required local share includes local share for foundation, compensatory education, LEP, and special education programs.

⁴The current total local appropriation excludes the local appropriation for student transportation.

Table 6.7b
Comparison of Proposed State and Local Shares and the Sum of
Current State Share for Major State Aid Programs and Current Total Local Appropriations
Fiscal Year 2015

Local Unit	Proposed State and Local Shares	Current State Share and Total Local Appropriations ¹	Change	Percent Change
Allegany	\$106,193,944	\$97,205,705	\$8,988,240	9%
Anne Arundel	\$1,161,936,991	\$872,262,781	\$289,674,210	33%
Baltimore City	\$1,449,109,710	\$1,091,079,255	\$358,030,454	33%
Baltimore	\$1,636,358,800	\$1,245,979,562	\$390,379,238	31%
Calvert	\$225,294,976	\$181,704,584	\$43,590,392	24%
Caroline	\$73,873,587	\$57,008,563	\$16,865,024	30%
Carroll	\$338,196,159	\$280,777,814	\$57,418,345	20%
Cecil	\$220,398,254	\$164,695,494	\$55,702,760	34%
Charles	\$370,978,635	\$296,167,005	\$74,811,631	25%
Dorchester	\$63,156,163	\$51,155,643	\$12,000,520	23%
Frederick	\$560,038,906	\$440,349,772	\$119,689,134	27%
Garrett	\$45,089,530	\$42,020,842	\$3,068,687	7%
Harford	\$550,008,571	\$389,381,412	\$160,627,158	41%
Howard	\$766,474,431	\$710,431,292	\$56,043,139	8%
Kent	\$28,665,436	\$24,122,223	\$4,543,213	19%
Montgomery	\$2,467,169,557	\$1,979,122,636	\$488,046,921	25%
Prince George's	\$2,110,671,451	\$1,510,255,217	\$600,416,234	40%
Queen Anne's	\$95,172,967	\$77,598,633	\$17,574,334	23%
St. Mary's	\$252,865,758	\$175,201,983	\$77,663,775	44%
Somerset	\$43,559,075	\$33,971,997	\$9,587,078	28%
Talbot	\$58,485,958	\$45,203,937	\$13,282,021	29%
Washington	\$300,346,598	\$245,648,490	\$54,698,108	22%
Wicomico	\$203,312,762	\$159,344,270	\$43,968,491	28%
Worcester	\$89,045,641	\$89,985,968	(\$940,327)	(1%)
Total State	\$13,216,403,859	\$10,260,675,080	\$2,955,728,780	29%

¹Current state share includes the foundation, compensatory education, LEP, special education, GCEI, guaranteed tax base, supplemental grant, NTI adjustment, and declining enrollment state aid programs. It excludes student transportation grants and the State share of teachers' retirement costs. The current total local appropriation excludes the local appropriation for student transportation.

Table 6.7c
Comparison of Proposed Per Pupil State and Local Shares and the Sum of
Current Per Pupil State Share for Major State Aid Programs and Current Total Local Appropriations
Fiscal Year 2015

Local Unit	Proposed	Current ¹	Change	Percent Change
Allegany	\$12,000	\$11,693	\$307	3%
Anne Arundel	\$14,789	\$11,450	\$3,339	29%
Baltimore City	\$17,165	\$13,750	\$3,416	25%
Baltimore	\$15,115	\$11,940	\$3,175	27%
Calvert	\$13,873	\$11,484	\$2,389	21%
Caroline	\$13,339	\$10,890	\$2,450	22%
Carroll	\$12,801	\$10,821	\$1,981	18%
Cecil	\$14,003	\$10,907	\$3,096	28%
Charles	\$14,049	\$11,604	\$2,446	21%
Dorchester	\$13,395	\$11,355	\$2,039	18%
Frederick	\$13,757	\$11,156	\$2,601	23%
Garrett	\$11,434	\$11,100	\$333	3%
Harford	\$14,477	\$10,508	\$3,969	38%
Howard	\$14,397	\$13,760	\$637	5%
Kent	\$13,327	\$12,091	\$1,235	10%
Montgomery	\$16,197	\$13,421	\$2,776	21%
Prince George's	\$16,959	\$12,661	\$4,298	34%
Queen Anne's	\$12,313	\$10,386	\$1,927	19%
St. Mary's	\$14,269	\$10,373	\$3,896	38%
Somerset	\$14,588	\$12,458	\$2,130	17%
Talbot	\$12,650	\$10,516	\$2,134	20%
Washington	\$13,261	\$11,197	\$2,064	18%
Wicomico	\$13,765	\$11,439	\$2,325	20%
Worcester	\$13,239	\$14,400	(\$1,161)	(8%)
Total State	\$15,241	\$12,295	\$2,946	24%

¹Current state share includes the foundation, compensatory education, LEP, special education, GCEI, guaranteed tax base, supplemental grant, NTI adjustment, and declining enrollment state aid programs. It excludes student transportation grants and the State share of teachers' retirement costs. The current total local appropriation excludes the local appropriation for student transportation.

Tables 6.8 through 6.12 show the total program, state share, and local share, for the foundation program; and total program and state share for the compensatory education, LEP, and special education programs. As is consistent with the move to a higher base amount, the foundation total program increases by \$4.5 billion, or 76 percent statewide under the proposed system. Similarly, given the proposed system's shift to lower weights, the proposed total program for compensatory education

decreases by \$852.6 million, or 36 percent and LEP total program decreases by \$141.2 million, or 37 percent. Special education, which has a higher weight under the proposed system (0.91 compared to 0.74 currently) increases by \$577.8 million, or 111 percent. As described above, the recommended changes in the way local wealth is calculated, the elimination of minimum state aid amounts, and imposition of required local shares lead to significant changes in the state share across counties for all four programs.

Table 6.8
Comparison of Proposed and Current Foundation Total Program, Fiscal Year 2015

Total Program				
Local Unit	Proposed	Current ¹	Change	Percent Change
Allegany	\$80,030,248	\$57,030,610	\$22,999,638	40%
Anne Arundel	\$956,378,725	\$532,008,490	\$424,370,235	80%
Baltimore City	\$996,155,844	\$567,217,618	\$428,938,226	76%
Baltimore	\$1,267,569,114	\$721,621,318	\$545,947,796	76%
Calvert	\$193,539,839	\$110,823,490	\$82,716,349	75%
Caroline	\$56,496,337	\$35,912,100	\$20,584,237	57%
Carroll	\$288,893,313	\$180,498,804	\$108,394,509	60%
Cecil	\$173,412,439	\$103,586,000	\$69,826,439	67%
Charles	\$308,093,992	\$178,594,784	\$129,499,208	73%
Dorchester	\$47,960,734	\$30,904,300	\$17,056,434	55%
Frederick	\$467,811,601	\$277,273,078	\$190,538,523	69%
Garrett	\$36,052,703	\$25,968,530	\$10,084,173	39%
Harford	\$448,260,424	\$254,197,300	\$194,063,124	76%
Howard	\$660,843,619	\$359,492,786	\$301,350,833	84%
Kent	\$22,256,851	\$13,822,557	\$8,434,294	61%
Montgomery	\$1,950,252,010	\$1,045,985,130	\$904,266,880	86%
Prince George's	\$1,547,189,187	\$857,542,710	\$689,646,477	80%
Queen Anne's	\$78,602,152	\$51,818,289	\$26,783,863	52%
St. Mary's	\$210,868,076	\$116,098,849	\$94,769,227	82%
Somerset	\$31,339,889	\$18,707,220	\$12,632,669	68%
Talbot	\$47,376,778	\$29,487,710	\$17,889,068	61%
Washington	\$237,971,479	\$150,503,255	\$87,468,224	58%
Wicomico	\$153,767,157	\$95,556,370	\$58,210,787	61%
Worcester	\$70,277,559	\$42,868,140	\$27,409,419	64%
Total State	\$10,331,400,071	\$5,857,519,438	\$4,473,880,632	76%

¹Current amounts exclude additional funding provided through the NTI adjustment grants.

Table 6.9
Comparison of Proposed and Current Foundation State and Local Shares, Fiscal Year 2015

Local Unit	Total State Share				Total Local Share			
	Proposed	Current ¹	Dollar Change	Change	Proposed	Current	Dollar Change	Change
Allegany	\$63,005,569	\$39,322,383	\$23,683,186	60%	\$17,024,679	\$17,708,227	(\$683,548)	(4%)
Anne Arundel	\$312,445,304	\$208,420,839	\$104,024,465	50%	\$643,933,421	\$323,587,651	\$320,345,770	99%
Baltimore City	\$844,621,834	\$410,660,390	\$433,961,444	106%	\$151,534,010	\$156,557,228	(\$5,023,218)	(3%)
Baltimore	\$618,319,525	\$363,429,623	\$254,889,902	70%	\$649,249,589	\$358,191,695	\$291,057,894	81%
Calvert	\$119,925,434	\$58,932,041	\$60,993,393	103%	\$73,614,405	\$51,891,449	\$21,722,956	42%
Caroline	\$47,414,797	\$25,115,561	\$22,299,236	89%	\$9,081,540	\$10,796,539	(\$1,714,999)	(16%)
Carroll	\$165,298,372	\$97,191,118	\$68,107,254	70%	\$123,594,941	\$83,307,686	\$40,287,255	48%
Cecil	\$126,104,957	\$62,872,334	\$63,232,623	101%	\$47,307,482	\$40,713,666	\$6,593,816	16%
Charles	\$223,682,886	\$108,473,587	\$115,209,299	106%	\$84,411,106	\$70,121,197	\$14,289,909	20%
Dorchester	\$36,286,173	\$19,242,908	\$17,043,265	89%	\$11,674,561	\$11,661,392	\$13,169	0%
Frederick	\$309,910,150	\$162,311,117	\$147,599,033	91%	\$157,901,451	\$114,961,961	\$42,939,490	37%
Garrett	\$14,359,473	\$8,885,474	\$5,473,999	62%	\$21,693,230	\$17,083,056	\$4,610,174	27%
Harford	\$273,958,856	\$135,734,462	\$138,224,394	102%	\$174,301,568	\$118,462,838	\$55,838,730	47%
Howard	\$272,574,368	\$158,918,877	\$113,655,491	72%	\$388,269,251	\$200,573,909	\$187,695,342	94%
Kent	\$0	\$2,551,449	(\$2,551,449)	(100%)	\$22,256,851	\$11,271,108	\$10,985,743	97%
Montgomery	\$149,422,769	\$344,851,008	(\$195,428,239)	(57%)	\$1,800,829,241	\$701,134,122	\$1,099,695,119	157%
Prince George's	\$1,161,073,185	\$533,848,244	\$627,224,941	117%	\$386,116,002	\$323,694,466	\$62,421,536	19%
Queen Anne's	\$28,219,832	\$21,548,679	\$6,671,153	31%	\$50,382,320	\$30,269,610	\$20,112,710	66%
St. Mary's	\$139,565,742	\$63,976,011	\$75,589,731	118%	\$71,302,334	\$52,122,838	\$19,179,496	37%
Somerset	\$26,803,830	\$12,974,047	\$13,829,783	107%	\$4,536,059	\$5,733,173	(\$1,197,114)	(21%)
Talbot	\$0	\$4,423,157	(\$4,423,157)	(100%)	\$47,376,778	\$32,014,349	\$15,362,429	48%
Washington	\$181,771,837	\$97,450,724	\$84,321,113	87%	\$56,199,642	\$53,052,531	\$3,147,111	6%
Wicomico	\$128,162,261	\$67,564,743	\$60,597,518	90%	\$25,604,896	\$27,991,627	(\$2,386,731)	(9%)
Worcester	\$0	\$6,430,221	(\$6,430,221)	(100%)	\$70,277,559	\$49,507,162	\$20,770,397	42%
Total State	\$5,242,927,155	\$3,015,128,997	\$2,227,798,158	74%	\$5,088,472,916	\$2,862,409,480	\$2,226,063,436	78%

¹Current amounts exclude additional funding provided through the NTI Adjustment grants.

Table 6.10
Comparison of Compensatory Education Total Program and State Share, Fiscal Year 2015

Local Unit	Total Program				Total State Share			
	Proposed	Current ¹	Dollar Change	Change	Proposed	Current	Dollar Change	Change
Allegany	\$15,250,085	\$30,808,020	(\$15,557,935)	(50%)	\$12,703,182	\$20,723,718	(8,020,536)	(39%)
Anne Arundel	\$103,422,355	\$157,706,454	(\$54,284,099)	(34%)	\$7,089,518	\$63,082,582	(55,993,064)	(89%)
Baltimore City	\$292,919,180	\$451,247,664	(\$158,328,484)	(35%)	\$270,249,598	\$327,714,001	(57,464,403)	(18%)
Baltimore	\$206,072,778	\$325,387,254	(\$119,314,476)	(37%)	\$108,944,638	\$135,832,813	(26,888,175)	(20%)
Calvert	\$15,633,408	\$24,653,070	(\$9,019,662)	(37%)	\$4,620,648	\$10,770,908	(6,150,260)	(57%)
Caroline	\$11,028,738	\$19,722,456	(\$8,693,718)	(44%)	\$9,670,134	\$13,702,149	(4,032,015)	(29%)
Carroll	\$18,316,215	\$31,872,660	(\$13,556,445)	(43%)	\$0	\$14,224,610	(14,224,610)	(100%)
Cecil	\$24,601,950	\$41,088,450	(\$16,486,500)	(40%)	\$17,524,721	\$21,834,914	(4,310,193)	(20%)
Charles	\$34,717,021	\$55,467,744	(\$20,750,723)	(37%)	\$22,089,067	\$28,928,798	(6,839,731)	(24%)
Dorchester	\$10,678,849	\$19,289,946	(\$8,611,097)	(45%)	\$8,932,327	\$10,677,511	(1,745,184)	(16%)
Frederick	\$40,942,734	\$66,134,106	(\$25,191,372)	(38%)	\$17,320,579	\$32,534,923	(15,214,344)	(47%)
Garrett	\$5,679,172	\$11,731,002	(\$6,051,830)	(52%)	\$2,433,851	\$4,692,401	(2,258,550)	(48%)
Harford	\$46,023,217	\$72,994,380	(\$26,971,163)	(37%)	\$19,947,595	\$32,715,145	(12,767,550)	(39%)
Howard	\$43,144,258	\$64,543,800	(\$21,399,542)	(33%)	\$0	\$25,817,520	(25,817,520)	(100%)
Kent	\$3,794,944	\$6,620,730	(\$2,825,786)	(43%)	\$0	\$2,648,292	(2,648,292)	(100%)
Montgomery	\$222,184,836	\$321,547,896	(\$99,363,060)	(31%)	\$0	\$128,619,158	(128,619,158)	(100%)
Prince George's	\$325,590,457	\$482,002,452	(\$156,411,995)	(32%)	\$267,827,265	\$254,495,324	13,331,941	5%
Queen Anne's	\$6,919,034	\$12,629,292	(\$5,710,258)	(45%)	\$0	\$5,051,717	(5,051,717)	(100%)
St. Mary's	\$22,717,847	\$34,926,846	(\$12,208,999)	(35%)	\$12,050,974	\$16,216,711	(4,165,737)	(26%)
Somerset	\$7,718,442	\$13,068,456	(\$5,350,014)	(41%)	\$7,039,844	\$8,906,534	(1,866,690)	(21%)
Talbot	\$6,643,224	\$11,657,808	(\$5,014,584)	(43%)	\$0	\$4,663,123	(4,663,123)	(100%)

Local Unit	Total Program				Total State Share			
	Proposed	Current ¹	Dollar Change	Change	Proposed	Current	Dollar Change	Change
Washington	\$39,985,115	\$70,725,366	(\$30,740,251)	(43%)	\$31,577,614	\$41,906,935	(10,329,321)	(25%)
Wicomico	\$31,000,118	\$54,156,906	(\$23,156,788)	(43%)	\$27,169,610	\$38,615,082	(11,445,472)	(30%)
Worcester	\$10,609,405	\$18,251,922	(\$7,642,517)	(42%)	\$0	\$7,300,769	(7,300,769)	(100%)
Total State	\$1,545,593,383	\$2,398,234,680	(\$852,641,297)	(36%)	\$847,191,167	\$1,251,675,638	(\$404,484,471)	(32%)

¹Current total program represents the program amount determined by the state aid formula. The actual funding received by a jurisdiction may differ depending on the amount of local share it elects to appropriate. These amounts exclude additional funding provided through the NTI adjustment grants.

Table 6.11
Comparison of Limited English Proficient Total Program and State Share, Fiscal Year 2015

Local Unit	Total Program				Total State Share			
	Proposed	Current ¹	Dollar Change	Change	Proposed	Current	Dollar Change	Change
Allegany	\$49,413	\$108,672	(\$59,243)	(55%)	\$0	\$85,434	(\$85,434)	(100%)
Anne Arundel	\$15,029,913	\$24,172,728	(\$9,139,256)	(38%)	\$107,561	\$9,669,091	(\$9,561,530)	(99%)
Baltimore City	\$12,198,281	\$20,409,960	(\$8,208,674)	(40%)	\$8,686,669	\$17,323,418	(\$8,636,749)	(50%)
Baltimore	\$16,347,801	\$27,378,552	(\$11,026,720)	(40%)	\$1,302,254	\$13,357,527	(\$12,055,273)	(90%)
Calvert	\$513,604	\$849,000	(\$335,271)	(39%)	\$0	\$433,512	(\$433,512)	(100%)
Caroline	\$984,140	\$1,901,760	(\$917,340)	(48%)	\$773,686	\$1,544,169	(\$770,483)	(50%)
Carroll	\$753,927	\$1,365,192	(\$611,064)	(45%)	\$0	\$712,078	(\$712,078)	(100%)
Cecil	\$552,160	\$984,840	(\$432,535)	(44%)	\$0	\$611,658	(\$611,658)	(100%)
Charles	\$1,092,744	\$1,847,424	(\$754,408)	(41%)	\$0	\$1,126,076	(\$1,126,076)	(100%)
Dorchester	\$404,200	\$781,080	(\$376,765)	(48%)	\$133,657	\$505,296	(\$371,639)	(74%)
Frederick	\$6,885,508	\$11,729,784	(\$4,842,549)	(41%)	\$3,226,339	\$6,744,127	(\$3,517,788)	(52%)
Garrett	\$9,265	\$20,376	(\$11,108)	(55%)	\$0	\$8,150	(\$8,150)	(100%)
Harford	\$1,458,696	\$2,424,744	(\$965,691)	(40%)	\$0	\$1,270,097	(\$1,270,097)	(100%)
Howard	\$9,027,153	\$14,236,032	(\$5,206,783)	(37%)	\$29,499	\$6,136,505	(\$6,107,006)	(100%)
Kent	\$228,461	\$441,480	(\$212,954)	(48%)	\$0	\$176,592	(\$176,592)	(100%)
Montgomery	\$90,867,220	\$138,998,280	(\$48,110,595)	(35%)	\$49,135,254	\$55,599,312	(\$6,464,058)	(12%)
Prince George's	\$76,388,754	\$120,680,256	(\$44,273,734)	(37%)	\$67,440,999	\$74,469,456	(\$7,028,457)	(9%)
Queen Anne's	\$558,851	\$1,079,928	(\$520,918)	(48%)	\$0	\$446,378	(\$446,378)	(100%)
St. Mary's	\$776,569	\$1,283,688	(\$506,930)	(39%)	\$0	\$696,586	(\$696,586)	(100%)
Somerset	\$308,166	\$584,112	(\$275,860)	(47%)	\$203,049	\$465,256	(\$262,207)	(56%)
Talbot	\$938,447	\$1,813,464	(\$874,750)	(48%)	\$0	\$725,386	(\$725,386)	(100%)

Local Unit	Total Program				Total State Share			
	Proposed	Current ¹	Dollar Change	Change	Proposed	Current	Dollar Change	Change
Washington	\$1,373,885	\$2,560,584	(\$1,186,322)	(46%)	\$71,528	\$1,773,214	(\$1,701,686)	(96%)
Wicomico	\$2,157,163	\$4,088,784	(\$1,931,019)	(47%)	\$1,563,802	\$3,407,287	(\$1,843,485)	(54%)
Worcester	\$490,916	\$930,504	(\$439,451)	(47%)	\$0	\$372,202	(\$372,202)	(100%)
Total State	\$239,395,236	\$380,671,224	(\$141,219,941)	(37%)	\$132,674,297	\$197,658,807	(\$64,984,510)	(33%)

¹Current total program represents the program amount determined by the state aid formula. The actual funding received by a jurisdiction may differ depending on the amount of local share it elects to appropriate. These amounts exclude additional funding provided through the NTI adjustment grants.

Table 6.12
Comparison of Special Education Total Program and State Share, Fiscal Year 2015

Local Unit	Total Program				Total State Share			
	Proposed	Current ¹	Dollar Change	Change	Proposed	Current	Dollar Change	Change
Allegany	\$10,864,199	\$6,867,828	\$3,996,371	58%	\$9,051,550	\$4,918,639	\$4,132,911	84%
Anne Arundel	\$87,105,998	\$40,267,908	\$46,838,090	116%	\$18,545,214	\$16,107,163	\$2,438,051	15%
Baltimore City	\$147,836,405	\$71,099,532	\$76,736,873	108%	\$131,702,299	\$54,975,400	\$76,726,899	140%
Baltimore	\$146,369,107	\$70,459,956	\$75,909,151	108%	\$77,242,301	\$31,316,134	\$45,926,167	147%
Calvert	\$15,608,125	\$7,416,036	\$8,192,089	110%	\$7,770,262	\$3,449,648	\$4,320,614	125%
Caroline	\$5,364,372	\$2,979,612	\$2,384,760	80%	\$4,397,443	\$2,203,987	\$2,193,456	100%
Carroll	\$30,232,704	\$15,735,600	\$14,497,104	92%	\$17,073,321	\$7,476,993	\$9,596,328	128%
Cecil	\$21,831,705	\$11,192,580	\$10,639,125	95%	\$16,794,790	\$6,332,622	\$10,462,168	165%
Charles	\$27,074,879	\$13,156,992	\$13,917,887	106%	\$18,087,472	\$7,305,806	\$10,781,666	148%
Dorchester	\$4,112,380	\$2,284,200	\$1,828,180	80%	\$2,869,368	\$1,346,154	\$1,523,214	113%
Frederick	\$44,399,064	\$21,740,508	\$22,658,556	104%	\$27,587,004	\$11,387,164	\$16,199,840	142%
Garrett	\$3,348,389	\$2,116,692	\$1,231,697	58%	\$1,038,671	\$846,677	\$191,994	23%
Harford	\$54,266,232	\$25,928,208	\$28,338,024	109%	\$35,708,022	\$12,372,389	\$23,335,633	189%
Howard	\$53,459,400	\$24,232,824	\$29,226,576	121%	\$12,119,654	\$9,693,130	\$2,426,524	25%
Kent	\$2,385,181	\$1,324,836	\$1,060,345	80%	\$0	\$529,934	(\$529,934)	(100%)
Montgomery	\$203,865,491	\$89,637,084	\$114,228,407	127%	\$12,127,867	\$35,854,834	(\$23,726,967)	(66%)
Prince George's	\$161,503,053	\$73,338,048	\$88,165,005	120%	\$120,392,567	\$41,226,980	\$79,165,587	192%
Queen Anne's	\$9,092,930	\$5,050,620	\$4,042,310	80%	\$3,728,631	\$2,020,248	\$1,708,383	85%
St. Mary's	\$18,503,266	\$8,791,632	\$9,711,634	110%	\$10,911,575	\$4,346,048	\$6,565,527	151%
Somerset	\$4,192,578	\$2,284,200	\$1,908,378	84%	\$3,709,616	\$1,657,449	\$2,052,167	124%
Talbot	\$3,527,508	\$1,959,336	\$1,568,172	80%	\$0	\$783,734	(\$783,734)	(100%)

Local Unit	Total Program				Total State Share			
	Proposed	Current ¹	Dollar Change	Change	Proposed	Current	Dollar Change	Change
Washington	\$21,016,120	\$11,258,568	\$9,757,552	87%	\$15,032,440	\$7,102,570	\$7,929,870	112%
Wicomico	\$16,388,323	\$8,928,684	\$7,459,639	84%	\$13,662,123	\$6,778,166	\$6,883,957	102%
Worcester	\$7,667,760	\$4,177,548	\$3,490,212	84%	\$0	\$1,671,019	(\$1,671,019)	(100%)
Total State	\$1,100,015,169	\$522,229,032	\$577,786,137	111%	\$559,552,190	\$271,702,888	\$287,849,302	106%

¹Current total program represents the program amount determined by the state aid formula. The actual funding received by a jurisdiction may differ depending on the amount of local share it elects to appropriate. These amounts exclude additional funding provided through the Net Taxable Income Adjustment grants.

Comparison to Prior Adequacy Study

The preceding section identifies the total cost of the study team's adequacy proposal compared to current funding levels. Since Maryland conducted a prior adequacy study, the study team has the unique opportunity to be able to compare the total adequacy recommendation not just to current funding but also to the estimates from the earlier work conducted on behalf of the Thornton Commission.

It is important to note what this comparison represents and what it does not represent. The comparison offered here simply examines the total adequacy need level(s) identified in the original work to that of the current study. Comparisons are only of the identified adequacy amounts and do not take into account the actual implementation of the original work. They are meant to examine what the results of the original work would be if adjusted to 2014-15 dollars. To make the base cost figures comparable, the original study figures were adjusted for inflation. The study team used a 1.40 factor to adjust the 2002 report figures to 2014-15 dollars based on the Bureau of Labor Statistics Consumer Price Index for Washington-Baltimore, DC-MD-VA-WV⁶⁷. The inflation figures used here differ from the approach used by the State for school funding formula purposes.⁶⁸ Total figures used in this section will vary from those in the previous section as the computations are made at the state level and are not district specific.

As noted previously, the results of the current and original studies differ in the way resources are allocated between the general education program provided to all students (base) and the resources for students with special needs (weights). The first adequacy study resulted in a system with a lower base amount (based upon the study's SSD results) and higher weights compared to the final adequacy recommendations in this report, which included a higher base and lower weights. This section will not investigate the specific resources that drive these differences but will instead examine the changes in the total cost of adequacy between the estimates generated 14 years apart.

The original study used the SSD and PJ approaches to determining adequacy, both of which have been used in the current study. The current work also has included a third approach to determining adequacy: the EB approach. With that in mind, the study team compared the prior study's SSD results to the current SSD results and the prior study's PJ results to the current study's final adequacy recommendations, the blended results of the EB and PJ approaches.

To make this comparison as directly as possible, two assumptions were made. First, for both the original and current study results, the figures used are prior to the federal funds adjustments as the study team feels this is the most direct comparison of the full cost of adequacy from each study. Second, because the SSD approach does not itself generate weights, weights were imputed for the current SSD estimate so that it could be compared to the base and weights of the other approaches. Weights for the current SSD column were calculated by dividing the SSD base into the per pupil resources identified for each special needs category from the current recommendation.

⁶⁷ http://www.bls.gov/regions/mid-atlantic/data/consumerpriceindexhistorical_washingtondc_table.htm

⁶⁸ The inflation adjustment used by the State in the funding formula is the lesser of the Consumer Price Index for the Baltimore-Washington region, the implicit price deflator for state and local governments, or 5 percent.

Table 6.13 below shows the results from this comparison. Again, these figures are the estimates prior to any adjustments for federal funding and are limited to costs generated from applying the base costs and weights to current student counts, so differ from full recommended system estimates in the prior section.

Table 6.13
Base Costs and Weights for Original and Current Adequacy Studies*

	Original SSD	Current SSD	Original PJ	Current Recommended**
Base Cost	\$5,969	\$8,716	\$6,612	\$10,970
Base Cost Adjusted for Inflation	\$8,362	\$8,716	\$9,263	\$10,970
Compensatory Education Weight	1.10	0.50	1.10	0.40
LEP Weight	1.00	0.50	1.00	0.40
Special Education Weight	1.17	1.39	1.17	1.10

*All base costs and weights are the amounts prior to the adjustments for federal funding.

**The current recommendation is a blended figure from PJ and EB results.

As shown in Table 6.13 when adjusted for inflation, the original SSD base cost figure is only about \$350 below the SSD base cost figure from the current study. The original PJ base cost figure, when adjusted for inflation, is more than \$1,700 below the current study’s recommended base cost figure, representing the shift toward more resources at the base level for all students. The weights for the original SSD and PJ studies are much higher than those produced by the current study, with the original compensatory and LEP weights being at least double that of the current weights. Special education weights are more similar between the original studies and current studies.

While the base and weights from the two studies varied, it is also important to consider the overall total costs. Therefore, the study team calculated total cost figures utilizing the inflation adjusted bases and the 2014-15 FTE, compensatory education, LEP, and special education student counts for Maryland. The student counts do not include the increased prekindergarten enrollment discussed in the recommendation section to create a more straightforward comparison. The figures are also prior to any adjustments for regional cost differences such as the GCEI or the CWI that are included as part of the full system comparison in the preceding section.

Table 6.14 shows the total adequacy cost estimates from the prior adequacy study compared to the current one.

Table 6.14
Total Adequacy Cost Estimates for Original and Current Adequacy Studies (in Millions)

	Original SSD	Current SSD	Original PJ	Current Recommended*
Total Adequacy Cost Estimate	\$11,974.3	\$10,473.8	\$13,264.2	\$12,380.1

*The current recommendation is a blended figure from PJ and EB results.

Overall, the comparison shows that though the results differ between the original and current studies in where resources are focused, low base and high weights versus high base and lower weights, the overall scale of adequacy need is within a comparable range across all four estimates when adjusted for inflation. The original PJ figures provide the highest total adequacy estimate and the current SSD identifies the lowest total adequacy estimate. Using the original SSD figures and then adjusted annually for inflation from 2002, the target adequacy cost estimate from the prior study in today's dollars would be very similar to the current recommended total cost of adequacy, about \$400 million apart.⁶⁹

Considerations for Phase-In

Given the difference in the study team's recommended adequacy figures from the current system, both in terms of overall cost and the structural shift to a higher base with lower weights, the study team recommends the state implement a multi-year phase-in. It is up to state policy makers to determine the length of time for the phase-in, which will determine much about the specifics of how the base and weight figures will be applied each year. Due to the significance of the changes, the study team offers three key considerations for how to structure any possible phase.

1. The study team believes that the recommended structure for a new formula is the right approach for Maryland to meet its educational goals for students.

The study team understands that the change from a current system that uses a lower base and a higher set of weights to one with a much higher base and a set of lower weights is a significant change and might seem radical to those familiar with the current formula. The shift to a system that targets more funds through the per student base amount reflects the resources Maryland educators identified as needed for all students. This includes providing some of supports and services currently targeted to special needs populations to all students. It also reflects the resources identified by the research literature underpinning the EB model and the recommendations of adequacy research from around country over the past decade, as presented in the previously released report, *A Comprehensive Review of State Adequacy Studies Since 2003* (September 2014).

The new formula recommended by the study team creates a higher per student base funding amount that parallels both 1) the higher state standards required of all students since the current formula was developed and 2) the goal of improving upon the current performance level of all students. Overall, students in Maryland are not meeting or exceeding 100 percent proficiency on the HSA, MSA, or PARCC. On average across all schools and all subjects, 73 percent of students were proficient on the MSA. On the HSA, the average across all schools and all subjects was 79 percent of students meeting or exceeding proficiency. The first year of PARCC assessments had much lower results with an average of 57 percent of students meeting or exceeding proficiency in math and 65 percent of students meeting or exceeding proficiency in reading. The changes to the formula recommended here are geared toward increasing the number of students meeting these educational goals. Further, while the recommended structure

⁶⁹ It is interesting to note that the results of the current PJ approach (prior to blending with the EB approach to create the final adequacy study recommendation) would be nearly identical to the original PJ, about \$100 million lower at \$13,152.1 million.

represents a shift in the way dollars will be distributed, it does not mean that the overall dollars are necessarily lower for special needs students, as shown in Table 6.15.

Table 6.15
Comparison of Recommended Per Pupil Funding and Current Per Pupil Total Funding
by Special Needs Categories

Student Need Category	Proposed Adequacy Target	Current System Target	Difference
Compensatory Education	\$14,688	\$13,514	\$1,174
LEP	\$14,688	\$13,651	\$1,037
Special Education	\$20,781	\$11,936	\$8,844

When looking at each weight independently, the proposed per student adequacy targets are higher than the current system targets even though the weights are lower.⁷⁰

Additionally, the recommended changes in the distribution of state and local district shares aim to improve the equity of the system. These changes include eliminating minimum guarantees for the foundation program and funding of special needs students and using a different approach to measuring local wealth. The equity of the system is significantly enhanced by ensuring the total program amounts for all of formulas targeting special needs students are fully funded.

2. Any new state dollars should first go toward the funding for students with special needs.

As the study team’s analysis documented, there are significant achievement gaps between general education and special needs, and the State would benefit from prioritizing the needs of these students. While the study team overall recommends more dollars for students at risk of academic failure, the shift to providing increased support services for all students as opposed to the current system’s more targeted approach to special needs students, results in lower weights and creates a particular issue when phasing in the recommended formula. Simplified approaches to phasing in the changes, such as specifying an annual overall percentage increase in funding over a period of years or adopting the recommended weights but a lower base amount, could leave current special needs students with less total targeted funding than they currently have. For example, the current funding system identifies the need of a LEP student at \$13,651, calculated on a base cost of \$6,860 and a LEP weight .99. These weights are designed to ensure that the language acquisition supports needed for a LEP student are available. If the State used a phase-in approach that targeted 70 percent of the recommendation in a given year, the formula would identify need for LEP students at \$10,282, 70 percent of the adequacy target of \$14,688 for LEP students. The targeted funding for a LEP student would be nearly \$2,400 less than the current system target, jeopardizing the supports needed for the student. Similarly, if the phase in approach was to take the recommended weights and apply them to a lower base, like the current

⁷⁰ This comparison is only of single weight categories and does not reflect differences when a student is eligible for more than one weight; when such a comparison is done, the resulting per student dollar amount is higher for all student combinations except for students that are eligible for both the LEP and compensatory education weights.

system’s base of \$6,860, a student could also receive less funding than current. Using our example of a LEP student, applying the recommended 0.35 weight would result in a per student amount of \$9,261, or \$4,390 less than the current system’s target.

Therefore, the study team believes phasing-in should instead be done in a manner to ensure sustained levels of targeted funding for special needs students. Table 6.16 shows the weights needed to ensure that special needs students receive the recommended adequacy amounts presented in this study while ensuring that they never receive less than the current target amount. The approach would allow the State to phase-in various base amounts, ranging from the current system’s base to the recommended adequacy base from this study, while still ensuring that students with the highest need can receive the supports and services necessary to address the meaningful achievement gaps that exist for these groups of students. It is important to note that the base figures below do not represent a suggested phase-in schedule. Instead, they are used to present an example of how weights would have to change in response to different base amounts during a phase-in. Also, the target base figure of \$10,880 would need to be adjusted annually for inflation to ensure that adequate resources are available at the time of full phase-in.

Table 6.16

Weights Needed to Generate Total Adequacy Target per Student with Various Base Cost Figures

Adjustment(s) for which student is eligible	Total per Student Recommended	Base Amount				
		\$7,000	\$8,000	\$9,000	\$10,000	\$10,880
Compensatory Education	\$14,688	1.10	0.84	0.63	0.47	0.35
LEP	\$14,688	1.10	0.84	0.63	0.47	0.35
Special Education	\$20,781	1.97	1.60	1.31	1.08	0.91

3. No district should receive less funding than it currently receives, in total, in the initial stages of phase-in.

The study team believes that the combination of state and local funding should ensure that every district receives at least a small increase in funding every year during the phase-in, when adjusted for student enrollment and demographic changes. Any phase-in can have unintended consequences and districts should not be negatively impacted during this period.

In order to ensure that districts do not receive a decrease in per student funding during phase-in, the State could guarantee an increased total program amount (excluding federal funding) for the phase-in period. It is, however, imperative that this funding is not permanent. The funding could be calculated by comparing a district’s current year per student total program for all major state aid programs to the current year’s projected total per student total program. A transitional hold harmless state aid amount could be determined for district’s whose annual increase in total program is below a targeted threshold.

VII. Additional Studies

This chapter presents the finding of five additional studies required by the RFP including:

1. The impact of concentrations of poverty on the study's adequacy estimates.
2. Determine if a relationship exists between school district spending and performance on state assessments.
3. Whether gaps in growth and achievement among student groups exists and provide recommendations of programs that might address these gaps.
4. The impact of quality prekindergarten on school readiness as a factor in the adequacy estimates.
5. Whether the Supplemental Grant program is still necessary within the context of the new adequacy recommendations.

Concentrations of Poverty

The correlation between a student's socioeconomic economic status (SES) and academic achievement has been well documented since the publication of the *Coleman Report* by the U.S. Department of Education in 1966. Subsequent studies have consistently observed the report's original findings: a school's demographics strongly correlate to its level of student achievement. Schools with a high percentage of low-income students, or schools with a high concentration of poverty, require additional services and resources to support student achievement. Because this correlation between economic composition and student achievement is so accepted, federal and state education budgets and aid distribution formulas reflect the need for resources to address effects of poverty.

Indeed, Maryland's current funding formula accounts for this relationship by including a weight to provide additional funding for schools serving low-income families (Wool et al. 2015). While the reality that low-income students benefit from additional services is not controversial, a debate has emerged surrounding how a higher concentration of poverty should be reflected in funding allocations. Maryland's adjustment, like those in the vast majority of state funding formulas, relies on a linear funding adjustment, meaning that additional funding per low-income pupil remains constant regardless of the district's concentration of poverty. Nonlinear adjustments, in contrast, provide more funding per low-income student as a district's concentration of low-income students increases. The question then becomes what type of funding formula, linear or nonlinear, most adequately supports both student achievement and efficiency in resource allocation.

To answer this question, the research team performed a literature review, focusing on the micro- and macro-level impact of high concentrations of poverty. The research team also detailed strategies that have been adopted in some schools to mitigate the negative effects of concentrated poverty. Based on the literature review, particularly its lack of significant evidence supporting nonlinear formulas, the research team recommends that the structure of the Maryland funding formula's low-income student weight remain the same. In other words, Maryland should continue its linear funding formula weight,

rather than adjust it in an exponential fashion as the concentration of poverty increases. This report presents the literature review on concentrations of poverty and common school-based strategies, including those implemented in Baltimore City Community Schools, to justify the research team's recommendation.

Measuring Poverty

In order to understand the literature surrounding concentrations of poverty, it is first important to define how poverty is measured. Common practice in education research involves using a student's Free and reduced-price meals (FRPM) status as a proxy for that student's status as low-income, in poverty, and/or at risk. Using FRPM as a reliable measure has limitations, especially since FRPM eligibility is much more lenient than other poverty classifications. Not all families are included because the count depends on the voluntary reporting of eligible families, and once counted, families are treated similarly regardless of the unique circumstances they might face. In a longitudinal study on students who qualify for subsidized school meals in Michigan, data show that the duration a student lives in poverty affects academic outcomes. The data suggests that, "there is a negative, linear relationship between grades spent in economic disadvantage and 8th grade test scores" and that "years eligible for subsidized meals can therefore be used as a reasonable proxy for income" (Micheltmore & Dynarski, 2016). This report suggests expanding FRPM data analysis to include years in poverty, not just present status. Current research in Maryland also documents the limitations of using FRPM as a measure of poverty. Schwartz (Schwartz, 2010, p. 7) states that the discrepancies between Montgomery County's own criteria⁷¹ for disadvantage and FRPM eligibility as a proxy for disadvantage "suggest the shortcoming of FRPM eligibility] as a single indicator of school need." Nevertheless, FRPM has provided a readily available measure of low-income status that is consistent across districts and states" (Wool et. al., 2015). Despite the limitations of this methodology, FRPM, as Schwartz states, still represents the most accessible way to collect data on student poverty.

The research team also completed a study, *Alternative Indicators of Low-income Students*, to analyze potential measures of poverty in Maryland. To analyze the consequences of using different indicators of low-income status for state funding, the research team simulates nine different indicator alternatives that include FRPM-based counts or various alternative indicators. The report recommends the continued use of free and reduced-price meals count. As a second choice, the report recommends using direct certification with a new State developed eligibility form for identifying economically disadvantaged students (Croninger et. al., 2015). The research team's study, therefore, supports Schwartz's claim that FRPM still represents the most reliable measure of poverty, especially for its precedence and familiarity.

⁷¹ In 2000, Montgomery County Schools identified the neediest elementary schools using multiple measures, including poverty and neighborhood location, to create a "red zone" of schools that were targeted with additional funding.

Summary of Concentrations of Poverty Literature Review

A plethora of research exists documenting the effect of high-poverty neighborhoods on family and child development. Understanding the macro-level impact of concentrations of poverty in neighborhoods ultimately contributes to understanding the micro-level effect of concentrated poverty on individual schools and students.

In 1990, Lynn and McGeary conducted a seminal study on “ghetto poverty” and the difference between neighborhoods with poverty rates above and below 40 percent. The researchers found that high-poverty neighborhoods “... experienced higher rates of unemployment than the poor living in areas with less-severe poverty; they were also more dependent on welfare and more likely to live in single-parent households” (Lynn & McGeary, 1990, p. 2). More recent studies corroborate these initial findings and also focus more on the behavioral effects of living in a high-poverty neighborhood. Atkinson and Kintrea (2001), examining whether it is worse to be low-income in a poor versus mixed neighborhood, “compared deprived and mixed neighborhoods along the dimensions of daily life, barriers to choice of neighborhood location, social networks, stigma and reputation, employment, and health” (Atkinson & Kintrea, 2001, p. 2294-2295). Their results show that area or neighborhood can compound the negative effects of poverty (Wool et al, 2016). At the neighborhood level, concentrated poverty has an observed negative effect on nearly all aspects of life. These negative macro-level correlations funnel down to affect child and adolescent development.

Researchers argue that areas with high concentrations of poverty lack the systemic support structures that affluent neighborhoods have to encourage success. Sampson et al. observe that “concentrated disadvantage” is correlated with a much lower incidence of “shared child control,” or the shared expectations and collaborative efforts of neighborhoods to supervise children’s well-being (Sampson et al., 1999, p. 633). As such, structural factors in disadvantaged neighborhoods can create barriers and lower shared expectations for children (Wool et al, 2016). Similarly, Reijneveld et al. conclude that higher concentrations of poverty lead to higher rates of psychosocial problems in children, as high-poverty neighborhoods can catalyze these issues. They cite the “lack of institutional resources in deprived areas such as health and day care; child-parent relationships in which the parents transfer their own economic, social and health difficulties and resulting psychological problems to the child; and a lack of norms and collective efficacy in these areas that shape child behavior” as primary causes for observed psychosocial problems (Reijneveld et al., 2004, p. 22; see also, Levanthal & Brooks-Gunn, 2000). These negative societal patterns found in high-poverty neighborhoods raise the question: What is the effect of a high poverty concentration on schools and student learning?

Because schools reflect the attributes of the communities they serve, it follows that systemic issues related to high-poverty concentrations would manifest within schools. Indeed, according to Jargowski (2013), poverty levels may intensify in schools due to the combination of exclusionary district boundaries, zoning practices and the drawing of school attendance boundaries that concentrate poor families in certain neighborhood schools and spur the movement of wealthy families away from low-income schools.

Researchers consistently observe that poverty negatively affects students in multiple ways, especially regarding language gaps, summer learning loss, attendance, and motivation (Boon, 2007; Carey, 2013; Hernandez, 2011). Because of these barriers to achievement, students from low-income backgrounds often underperform. While some literature presents this relationship between concentrated poverty in schools and achievement as a linear relationship, other literature describes nonlinear leaps in challenges when schools reach a certain “critical mass” of poverty (Wool et al, 2016). An *amicus* brief from the NAACP Legal Defense and Educational Fund, Inc. and the New York Civil Liberties Union, prepared for *Paynter v. State* (Poverty & Race Research Action Council, 2015) marks a critical mass of poverty at 25 percent. Their research shows that when poverty levels increase to 25 percent or greater, then 56 percent of poor and 36.9 percent of non-poor students underperform, compared to only 27.6 percent and 11 percent respectively for schools with less than seven percent poverty (Kennedy et al., 1986; Brief Amicus Curiae, 2001, p. 24). The problems that low-income students face become school-wide problems when poverty concentrates, thus leading to absence of positive peer influence, lack of parental involvement, and a depreciated quality of school resources such as teachers and curricula.

While the research clearly supports increased funding for low-income students, it is not conclusive as to whether increased funding should be linear or nonlinear. Indeed, the research does not establish a definitive relationship between increased challenges and the resources needed to help. Further, panels of Maryland educators were asked directly about the need for a nonlinear approach to funding the compensatory education program in both the EB and PJ studies, but there was no consensus for such a change.⁷² What is clear, however, is that school-based and wrap-around supports can effectively address and minimize challenges associated with low-income schools. Therefore, the research team suggests that Maryland maintain its linear student weighting formula, which provides significant increased funding to low-income schools. For example, in fiscal year 2015, Maryland’s compensatory–education funding formula provided an additional \$6,654 per FRPM-eligible student⁷³. In a school of 500 students with 50 percent of students eligible for FRPM, this totals nearly \$1.7 million in additional funding. The research team also suggests that those schools continue to implement strategies proven to increase achievement in schools with high concentrations of poverty.

Suggested Educational Strategies

To combat the negative effects of highly concentrated poverty in schools, the research team suggests that Maryland support, or continue to support, research-based strategies shown to be effective in combating the effects of concentrated poverty and reducing the achievement gap between economically disadvantaged and more advantaged students. Four of these strategies should be part of the State’s strategy — prekindergarten, summer school, afterschool programs, and finally, well-qualified community schools coordinators who connect schools to local supporting resources.

⁷² Participants in the school-level PJ panels were specifically asked to consider the resources needed to serve schools with concentrations of 25 percent, 50 percent, and 75 percent economically disadvantaged students.

⁷³ This is the total state and local amount. However, local county school boards are not required to raise their full appropriation. They may also raise more than the assumed local share.

As outlined in the research team's *A Comprehensive Analysis on Prekindergarten in Maryland* (2015) and this report's section on universal prekindergarten and school readiness, prekindergarten has positive effects on school readiness that can translate to a student's future. Yoshida et al. posit that, "high-quality early childhood education programs are among the most cost-effective educational interventions and are likely to be profitable investments for society as a whole" (2013, p. 13). Specifically, for a year spent in prekindergarten, children get an average gain of "about a third of a year of additional learning across language, reading, and math skills," though gains have been shown to be as high as one full year of additional learning in math and reading (Yoshikawa et al., 2013, p. 1). Because research shows that prekindergarten programs encourage holistic student success and higher outcomes, it follows that enacting prekindergarten programs in high-poverty areas can help mitigate the negative effects of concentrations of poverty. Additionally, because the return on investment of prekindergarten is so significant, implementing these programs could also minimize the need for both linear and nonlinear adjustments to funding for high-poverty schools.

Similarly, summer school programs help combat observed summer learning loss among low-income students. Initiating a year-round instructional calendar or providing additional summer programs both represent effective ways to minimize this gap. A number of studies have found that summer school programs increase reading achievement for low-income or at risk students (Chaplin & Capizzano, 2006; Zvoch & Stevens, 2012; Kim & Quinn, 2013; Schacter & Jo, 2005; Borman & Dowling, 2006; Shapiro et al., 1986; Borman et al., 2009). As with prekindergarten programs, proactively offering summer school programs can help to alleviate issues that low-income students face, especially regarding school readiness and academic underperformance.

The justification for after-school programs is similar, as these programs, like prekindergarten and summer school, enhance school readiness and academic performance. A number of evaluations of state-level after-school programs have found that students in these programs have improved academic performance. Baltimore City Public Schools' Out of School Time (OST) programs yielded (1) higher rates of school attendance, generally; (2) higher rates of school attendance following the critical transitions from grade five to grade six and from grade eight to grade nine; (3) higher rates of grade-level advancement; (4) higher numbers of credits earned in high school; and (5) fewer rates of chronic absence (Olson et al, 2013, p. v). After-school programs, therefore, work in conjunction with other school-based supports to raise student achievement levels and well-being.

Research also suggests that schools with highly concentrated poverty implement wrap-around services and hire dedicated community coordinators. Wrap-around or integrated student supports (ISS) services "focus on the nonacademic factors that influence educational outcomes" (Moore, 2014, p. 5). Potential wrap-around services include programs in health, mental health, extended nutrition (e.g. dinner or meals during school vacations), and restorative justice (Wool et al., 2016). Additionally, the Community Schools model suggests hiring at least one full-time community schools coordinator, whose serves as a liaison between school and home. Thus, while other educational strategies aim to increase academic performance, these programs seek to promote holistic well-being and school-to-family contact. Although schools, by nature of the community model, house these wrap-around programs, funding

allocations do not necessarily come exclusively from education budgets. Instead, schools and districts form community partnerships with public and private sources to fund the resources needed for wrap-around services.

Summary

Research on the adverse relationship between low-income backgrounds and student and school success is clear and ubiquitous. Researchers have begun to look more closely, now, at how higher concentrations of poverty might affect student outcomes. As a result, policy makers face the question of whether high poverty concentrations merit nonlinear adjustments (where the per student funding increases with higher poverty concentrations) or whether linear adjustments (using a consistent amount of funding per low-income student) should remain. The research team concludes, at this time, that the evidence does not justify nonlinear funding mechanisms, even though the challenges that high-poverty schools face are readily observed. Instead, the research team recommends that Maryland maintain its linear funding formula, which already allocates more funding to low-income students and schools, and combine these efforts with other educational strategies. These strategies include prekindergarten, summer school, after-school programs, and the coordination of wrap-around services through the use of school-based community liaisons. With this multi-faceted approach, the research team believes that Maryland schools will have the resources needed to effectively tackle the challenges associated with poverty and schooling.

Proficiency Gaps

Elementary and Middle School

The RFP asked the contractor to identify gaps in growth and achievement among student groups disaggregated by race and income and make recommendations on specific programs to address the gaps in growth or achievement. The study team analyzed the average percentages of students proficient in math, reading, and science for each grade in elementary and middle school in Maryland, broken down by race and subgroup, limited English proficient (LEP),⁷⁴ students who qualify for free and reduced-price meals (FRPM), and special education, to see where achievement gaps exist. The study team used Maryland School Assessment (MSA) data to look at elementary and middle schools for school years 2010 to 2012. To gain the deepest understanding of the achievement gaps, APA looked at achievement gaps at the school- and grade-levels. Students identified as LEP were compared to students who were non-LEP. Non-LEP was determined by taking the total number of students tested and subtracting the number of students who were classified as LEP from the total. The same was done with the students who scored proficient. Table 7.1 shows an example of the LEP gaps for a sample district. The study team then divided the number of proficient non-LEP students by the number of non-LEP students who took the test. The same steps were taken for the FRPM and special education subgroups as well.

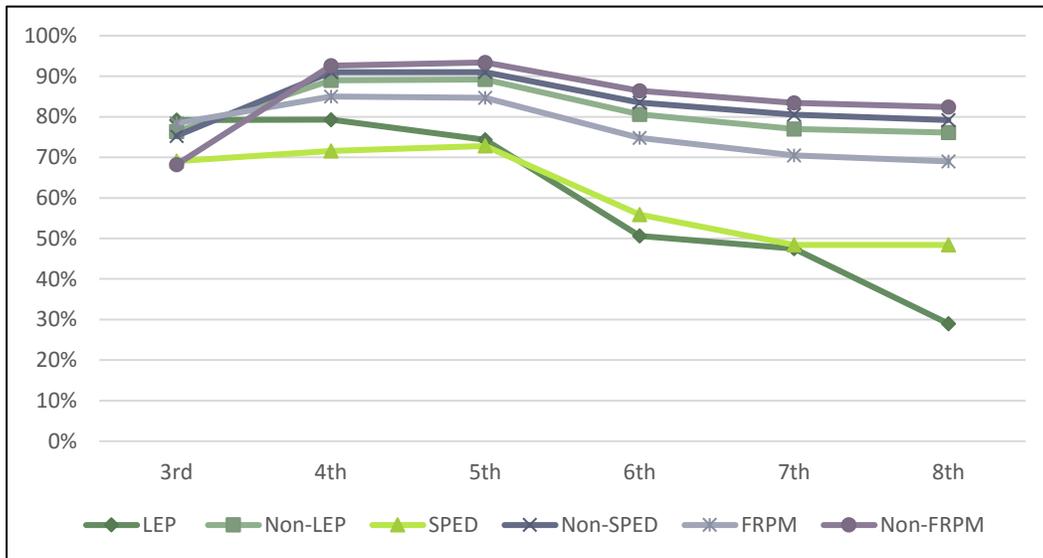
⁷⁴ LEP students have been referred to as LEP students throughout this report. The student populations are the same, but as Maryland assessment results use the ELL category, this report and the following report will use the LEP title.

Table 7.1
LEP Proficiency Gaps for a Sample District

Calculation of Non-LEP Students							
	All Students Tested	All LEP Students Tested	Non-LEP Students Tested	All Students Proficient	All LEP Students Proficient	Non-LEP Students Proficient	% Non-LEP Students Proficient
District A	100	25	75	80	20	60	80%

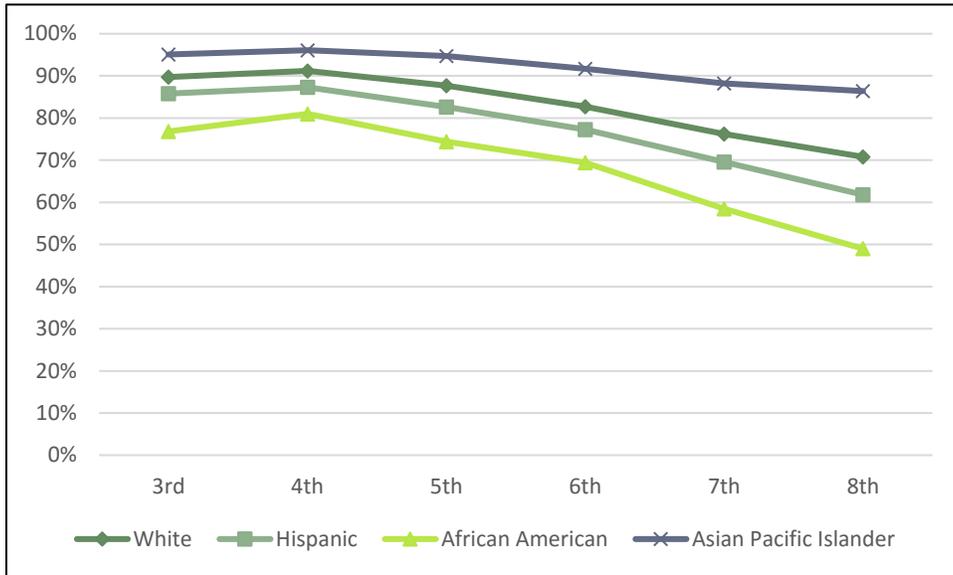
Across all grades, the average percentage of students who qualify as FRPM and special education in 2012 were 44 percent and 11 percent, respectively. However, in 2012, there are only two percent of LEP students in eighth grade and 10 percent in grade three. This trend was expected because students should begin to move out of the LEP program by grade eight. Forty percent of the students in elementary and middle schools in Maryland identify as African American, 36 percent as white, five percent Asian or Pacific Islander, and 15 percent Hispanic.

Figure 7.1
Average Percentage of Students Proficient in Reading by Subgroup and Grade



In 2012, the percentage of LEP students who are proficient in reading is highest in grade three at 79 percent, while only 29 percent of LEP students are proficient in grade eight (see Figure 7.1). The gap between LEP and non-LEP students increased from three percentage points in grade three to 47 points in grade eight, while the gap between special education students and non-special education students remained constant across the grades at 30 percentage points. In grade three there was a higher percentage of FRPM students proficient in reading than non-FRPM students. However, the gap between FRPM and non-FRPM is reversed in all other grades ranging from five percentage points to 11 percentage points. These gaps and lack of overall proficiency, especially in the earlier grades, are concerning for the overall performance of Maryland students.

Figure 7.2
Average Percentage of Students Proficient in Reading by Race and Grade



The achievement gaps in reading exist between races as well. African American students achieved 22 percentage points below their white peers in grade eight. The achievement gap is smaller in third grade, with African American students 13 percentage points below their white peers. Across all grades, Asian or Pacific/Islander students have a higher rate of proficiency than other races. In 2012, grade three Hispanic students performed on average nine percentage points below their Asian or Pacific/Islander peers; however, grade eight Hispanic students performed on average 24 percentage points below their Asian or Pacific/Islander peers. Larger gaps between races exist in the later grades.

Figure 7.3
Average Percentage of Students Proficient in Math by Subgroup and Grade

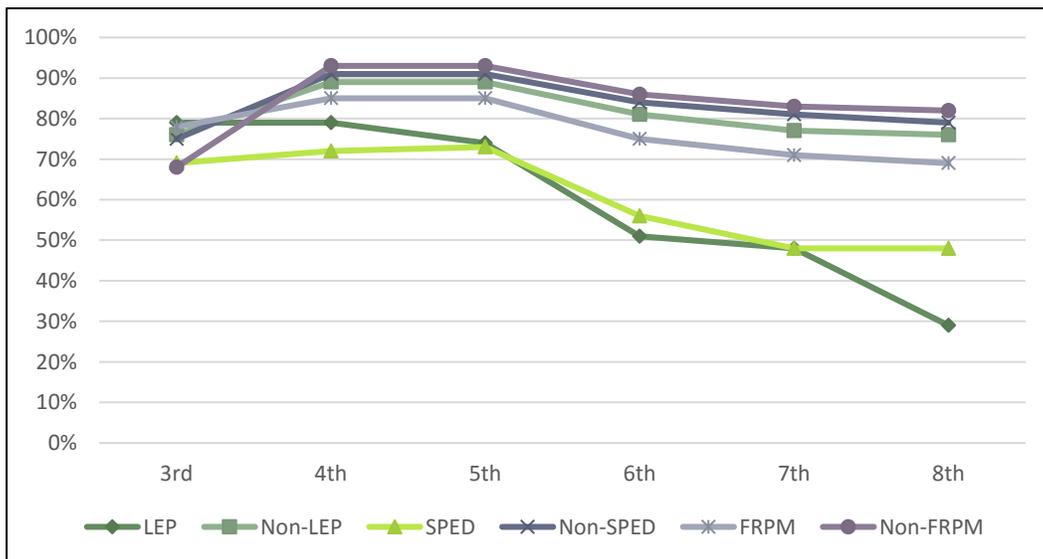
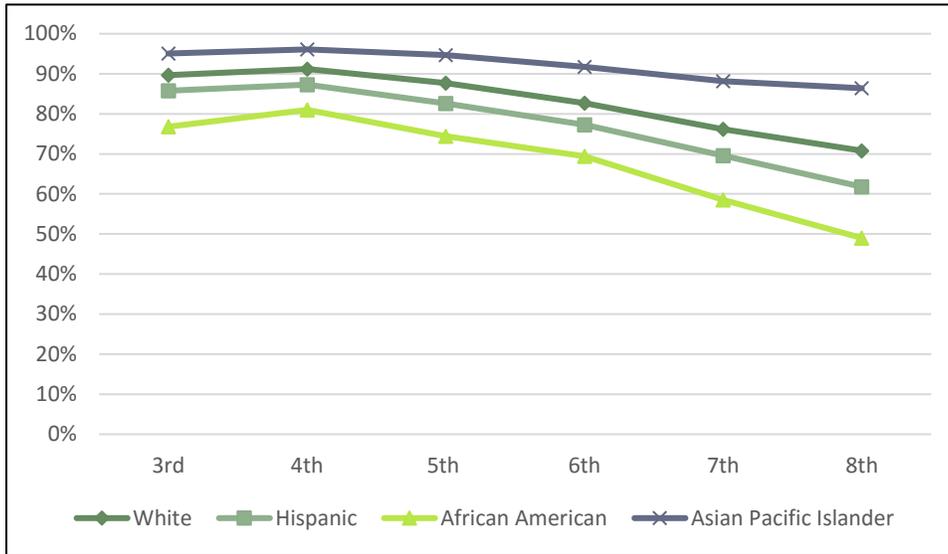


Figure 7.4
Average Percentage of Students Proficient in Math by Race and Grade



The math achievement gaps among elementary and middle schools are similar to the reading gaps in 2012. There was a lower rate of students proficient in math in the later grades than in the earlier grades. Eighty-one percent of students who qualify for FRPM were proficient in math on average in grade three and only 53 percent were proficient in math on average in grade eight. The gap between special education students and non-special education students across grades on average was 26 percentage points, between FRPM and non-FRPM was 12 percentage points, and between LEP and non-LEP was 15 percentage points. The gaps became much more prominent in the later grades. Students who identify as Asian or Pacific/Islander were most likely to be proficient in math, where 95 percent of these students in grade three and 86 percent of these students in grade eight achieved proficiency. African American students were least likely to be proficient in math, while 77 percent of students in grade three were proficient and 49 percent of students in grade eight were proficient.

High School

Similar to the elementary and middle school analysis, the study team looked at the achievement gaps among subgroups and race for high schools in Maryland. The research team used data from Maryland High School Assessment (HSA) for school years 2011 to 2013 to analyze achievement gaps. Unlike the elementary and middle school analysis, the study team did not evaluate the scores at the grade-level; instead, the team just looked at algebra and English subject areas. Forty-six percent of the tested students identified as white, 35 percent as African American, nine percent as Hispanic, six percent as Asian or Pacific/Islander, and three percent as “other.” One percent of the population was classified as LEP, eight percent as special education and 32 percent as FRPM-eligible.

Figure 7.5
Average Percentage of High School Students Proficient in Algebra by Subgroup

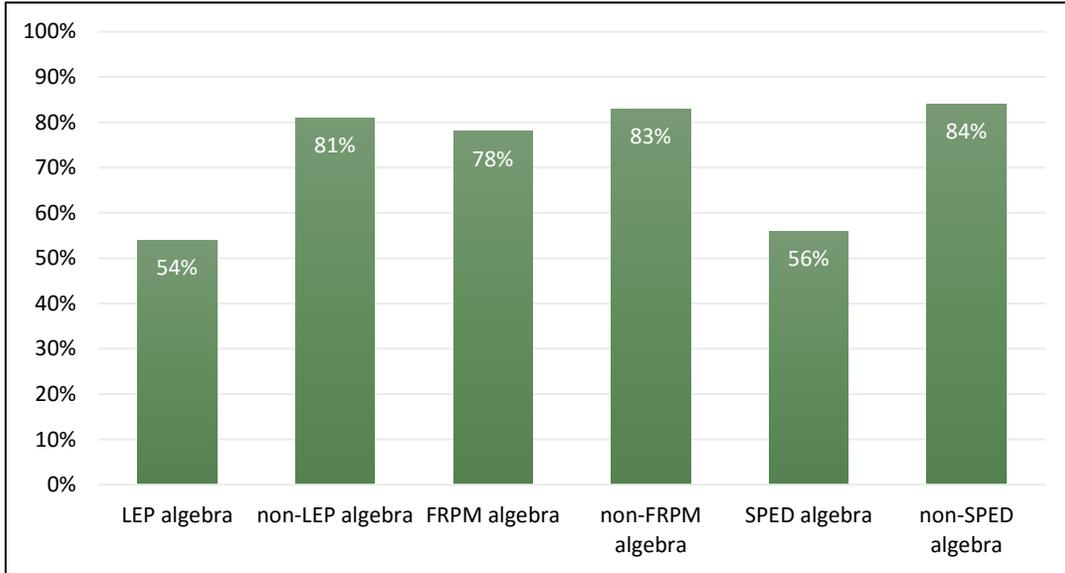
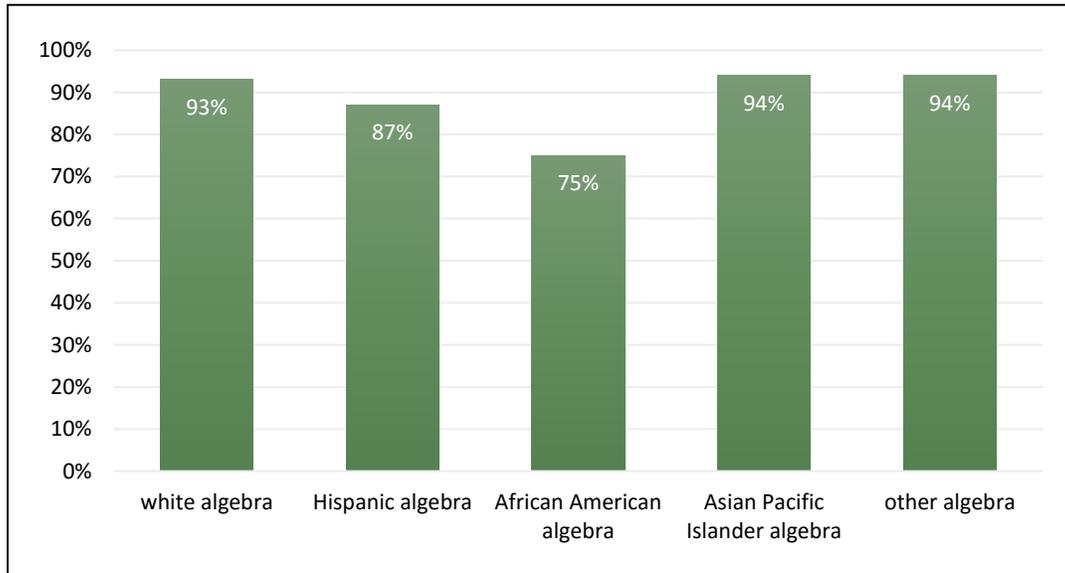


Figure 7.6
Average Percentage of High School Students Proficient in Algebra by Race



The students from the white, Asian or Pacific/Islander students, and “other” categories had the highest percent of students proficient in high school algebra with 93 percent, 94 percent, and 94 percent of students proficient respectively (Figure 7.6). The percentage of African American students proficient in algebra are 19 percentage points below their white peers. Similarly, Hispanic students were below their peers by seven percentage points.

The gaps among different subgroups in high school math were similar to the ones the study group observed in elementary and middle schools. The largest achievement gaps in 2013 were between special education and non-special education students with 28 percentage points and 27 percentage points between LEP and non-LEP. The FRPM gap was smaller than that of the elementary and middle school level, with a difference of only five percentage points (Figure 7.5).

Figure 7.7
Average Percentage of High School Students Proficient in English by Race

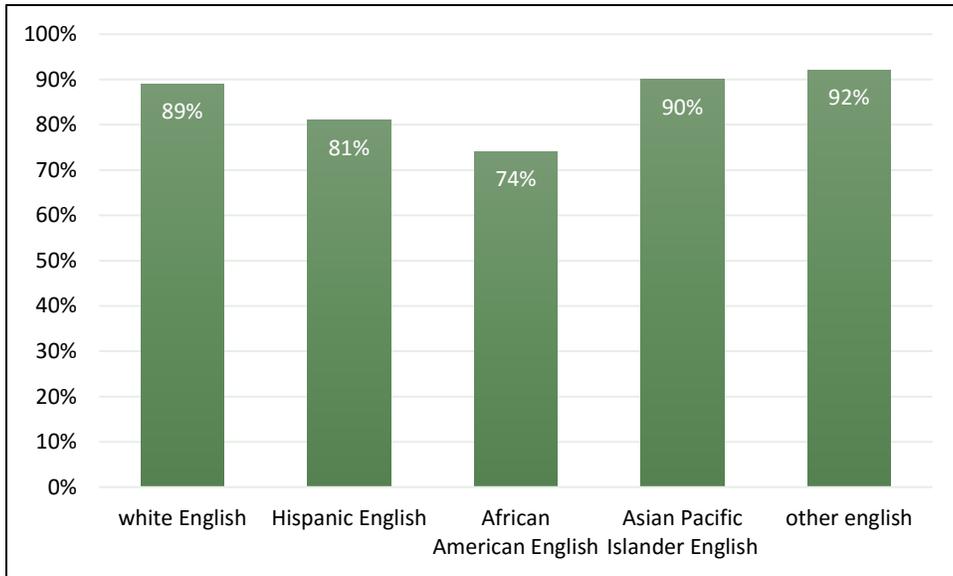
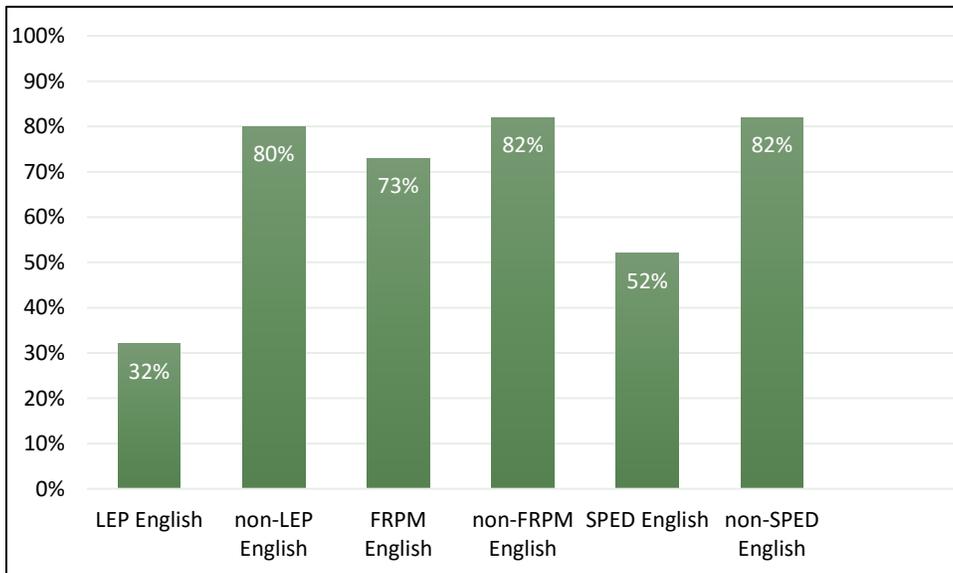


Figure 7.8
Average Percentage of High School Students Proficient in English by Subgroup



In Figure 7.7 the achievement gap between Asian or Pacific/Islander students and African American student was 16 percentage points in English, while the gap between white and Asian Pacific/Islander students is only one percentage point. Also, there was a low percentage of LEP students proficient in English, 32 percent at the high school level in 2013. The achievement gap between LEP students and non-LEP students was 48 percentage points, which is significant compared to the gap between FRPM and non-FRPM students, which was 10 percentage points. The gap between special education and non-special education is a difference of 30 percentage points. The overall percentage of Maryland students proficient in high school algebra and English is less than 95 percent, and the gaps by race and subgroup are large. There is a need for increased performance in Maryland.

Recommendations

The proficiency gaps among Maryland students are evident across racial and high-needs categories. The study team through the PJ and EB studies has recommended various programs that will help with closing the achievement gaps. The recommendations include smaller early elementary class size, effective teachers and instruction with an emphasis on teacher development, interventions for struggling student, and high-quality prekindergarten programs.

High-quality prekindergarten is a way to improve and minimize achievement gaps early. A year spent in prekindergarten results in an average gain of “about a third of a year of additional learning across language, reading, and math skills” (Yoshikawa et al., 2013, p. 1). A study of prekindergarten in Chicago found that students who attended the Chicago Child-Parent Center (CPC) program had 29 percent higher graduation, 41 percent lower rates of enrollment in special education, 33 percent lower rates of juvenile detention, and 51 percent lower rates of child maltreatment (Rice University Center for Education, 2012). These are all valuable outcomes to help promote students’ success and achievement later in school.

Smaller elementary class sizes in grades kindergarten to grade three also increase student achievement. The Tennessee STAR study found that students in small classes achieved a higher proficiency level of 0.25 standard deviations than those in regular classes. The impact was larger for students of low-income and minority students, about 0.5 standard deviations (Finn, 2002; Grissmer 1999; Krueger 2002). Similarly, the Wisconsin pilot project found that when class sizes in grades kindergarten to grade three were reduced to 15-to-1 in high-poverty schools that students achieved higher reading, math, and language arts scores (Molnar, Smith, Zahorik, Palmer, Halbch, & Ehrle, 1999). These are two important studies that emphasize the positive effect of smaller class sizes in early elementary classes especially on low-income and minority students.

Effective teachers with access to quality professional development also influence student achievement (Rowan, Correnti, & Miller, 2002). Effective professional development produces changes in teachers’ classroom-based instructional practices that can be linked to improvements in student learning.

According to case studies of the current Maryland adequacy study, these six features of effective professional development raise student achievement (Odden & Picus, 2015):

- Activity-based;
- close to 200 hours of professional development a year;
- emphasis on collective participation of teachers in the same school, department, or grade;
- content-focused;
- opportunities of active learning; and
- coherence with performance standards, teacher evaluations, and district and school goals.

Lastly, interventions for struggling students are key to advancing student achievement. These interventions consist of one-on-one or small group tutoring and extra learning time. The most effective extra help strategy to enable struggling students to meet career ready standards involves individual one-to-one tutoring provided by a licensed teacher (Shanahan, 1998; Wasik & Slavin, 1993). A study found that high school students from low-income and minority backgrounds who received individualized tutoring and counseling improved in math by 0.65 standard deviations and 0.48 standard deviations in reading (Cook, et al., 2014). Extended learning time specifically extended-day interventions have positive results on students learning. In a study at Boston schools with a seven-and-a-half-hour school day, researchers found a 13 percent increase in the percent of students who passed the basic skill sets over three years (Adelman, Haslam, & Pringle, 1996). Both of these interventions address the populations where Maryland has the greatest disparities.

The PJ, EB, and resulting recommendations all point to additional programs and interventions to assist in minimizing the achievement gaps.

Correlating Funding and Performance

One of the analyses required under the Maryland Request for Proposal (RFP) is to correlate the deficits in student performance with deficits in education funding. This analysis used data on district expenditures, as well as student demographics and assessment results, by district, for the state of Maryland for the years 2012-2015. These data were provided by the MSDE. The assessment data included the proportion of students in a district who scored proficient or advanced on the High School Assessment (HSA), Maryland School Assessment (MSA), and Partnership for Assessment of Readiness for College and Careers (PARCC) assessments. PARCC data was available only for 2015, while MSA and HSA data were available for 2012-2015. Assessment data used for this analysis differs from those used in previous analyses so that data from the PARCC, the assessment currently used by the State, could be included. The expenditure data included district spending as reported by districts in their annual school financial reports and categorized according to the financial accounting structure specified in the

*Financial Reporting Manual for Maryland Public Schools.*⁷⁵ This analysis examined total district instructional expenditures per pupil and total district current expenditures per pupil.

The team completed a number of linear regressions to analyze the relationship between district spending and each individual performance outcome. Each regression had the proportion of students in a district who were proficient or advanced on each individual assessment — HSA, MSA, or PARCC. Each regression also included a panel of demographic information for the districts: the proportions of students who were in special education, who were free and reduced-price meal (FRPM) eligible, who were Limited English Proficient (LEP), who were black, who were Latino, or who were white. The regression also included the total district enrollment size and the year the assessment was administered. In addition to those covariates, each regression included a measure of spending. For each assessment, the study team examined both the district total instructional expenditures and the total district current expenditures, both adjusted to per pupil figures.

Analysis

Table 7.2 reports the coefficient for the spending variables in each of the regressions, controlling for the demographic characteristics of the districts.⁷⁶

Table 7.2
Correlation Between Total Per Pupil Expenditures and Performance

Assessment Outcome	Expenditure Variable	Coefficient
HSA	Total expenditures per pupil	0.00
MSA	Total expenditures per pupil	0.000009*
PARCC	Total expenditures per pupil	0.00003*

The study team first looked at the correlation between total expenditures per pupil and performance. None of the coefficients for spending were significant at the 0.05 level⁷⁷ in any of the regressions. The coefficients marked with an asterisk were significant at the 0.10 level. There appears to be some relationship between total district per pupil expenditures and student performance on the MSA and PARCC, but not on the HSA. This means that every additional \$1,000 of per pupil total spending is associated with an increase of about one percent in the proportion of districts’ students proficient on the MSA. Every additional \$1,000 of per pupil total spending is associated with an increase of about 2.6 percent in the proportion of districts’ students proficient on PARCC.

⁷⁵ Maryland State Department of Education. (2009). *Financial Reporting Manual for Maryland Public Schools*. Baltimore, MD: Author.

⁷⁶ Coefficients smaller than 0.0000001 have been rounded to zero.

⁷⁷ This refers to a significance level, a statistical measure of how likely the result is correct, in this case whether there is a relationship between expenditures and student performance. A significance level of 0.05 means that there is a 95 percent chance that the finding is correct – a very high standard. A significance of 0.10 means that there is a 90 percent chance.

Table 7.3
Correlation between Instructional Expenditures and Performance

Assessment Outcome	Expenditure Variable	Coefficient
HSA	Instructional expenditures per pupil	0.00
MSA	Instructional expenditures per pupil	0.00001
PARCC	Instructional expenditures per pupil	0.00003

Since there was no meaningful correlation between total spending and performance at a highly significant level, the study team analyzed the correlation between instructional spending and performance. As Table 7.3 shows, none of the coefficients for instructional spending were significant at the 0.05 level in any of the regressions. Although the coefficients are not significant, the direction and size of the relationship is roughly the same as with total spending. Every additional \$1,000 of per pupil total spending is associated with an increase of about one percent in the proportion of districts' students proficient on the MSA. Additionally, every additional \$1,000 of per pupil total spending is associated with an increase of about three percent in the proportion of districts' students proficient on PARCC.

Implications

Until recently, studies of the relationship between school spending and student performance have found, at best, a weak correlation between funding and student achievement (Hanushek, 1986; 1989). However, two recent studies from the National Bureau of Economic Research (NBER) found both statistically and practically significant positive relationships between higher spending and student outcomes. The first study (Jackson, Johnson & Persico, 2014), which examined the impact of statewide, often court-ordered, school finance reforms between 1967 and 2010 found that a 20 percent annual increase in funding for low-income children led to an average of nearly one additional year of schooling completed, 25 percent higher individual earnings, and a 20 percentage point drop in the incidence of adult poverty. These increases were strong enough to eliminate at least two-thirds or more of the gaps in these adult incomes between persons raised in economically disadvantaged families and those raised in more affluent families.

The second NBER study of states implementing adequacy reforms since 1990 (Lafortune, Rothstein & Whitmore Schanzenbach, 2016) found a significant reduction in the achievement gaps on the National Assessment of Educational Progress (NAEP) between districts with poor funding prior to the reforms and wealthy districts. The researchers found that:

The (local) average effect of an extra \$1,000 in per pupil annual spending is to raise student test scores 10 years later by 0.18 standard deviations. This is roughly twice as large as the effect implied by the annual additional spending in the Project STAR class size experiment (which, translated into these terms, corresponds to an approximately 0.085 standard deviation effect per \$1,000 per pupil). It implies that marginal increases in school resources in low-income,

poorly resourced school districts are cost effective from a social perspective, even when the only benefits considered are those operating through subsequent earnings (pp. 6-7).

In Maryland, an analysis conducted by MGT of America evaluated the state's education system after the implementation of the Bridge to Excellence Act based on the findings of the Thornton Commission. MGT found that achievement gaps were closed by 51 percent in reading and 49 percent in math for elementary schools, and by 36 percent in reading and 39 percent in math for middle schools (MGT of America, 2008). They also found that a \$1,000 increase in spending leads to proficiency gap closure of four percent at the elementary school level and eight percent at the middle school level. MGT cites that a reason for these successes in linking funding and achievement are due to how the resources were used. The programs that consistently produced positive results spent dollars on the following: recruiting and retaining high-quality teachers, continuing high-quality professional development, and providing instructional tools for students. It is possible the current analysis of the relationship between spending and performance is mixed because state funding has not kept pace with the adequacy targets and inflation since implementation of the Bridge to Excellence Act in 2002.

These findings suggest that greater investments in education can have significant effects on student, school, and district performances. One possible explanation of these more recent positive results found by NBER and MGT is that in this era of high-stakes accountability, districts and schools are making more effective use of the resources. Increasingly, research indicates that while the amount of resources going to schools is important, the capacity to make effective use of these resources may be just as important (Cohen, 2002; Grubb, 2009).

This thinking is consistent with the logic behind the school and district resourcing models used in the PJ and EB approaches to determining adequacy for this study. New money received by districts and schools spent on strategies and programs which are unlikely to result in increased student achievement is likely to blunt the positive impact of additional spending on student outcomes. The list of resources, strategies and programs that would result in increased student achievement (such as those identified in the PJ and EB studies) is a much more promising investment.

Prekindergarten and School Readiness

Introduction

Catalyzed by an increased national interest in early childhood education and positive research findings, the federal and state governments have championed the inclusion of prekindergarten programs. Indeed, 40 states and D.C. currently offer state funded prekindergarten programs, targeted toward three- and four-year-old children. Specifically, Maryland has moved to expand access to prekindergarten setting with the 2014 Prekindergarten Expansion Act and \$15 million Preschool Expansion Grant as foundational steps in this process (Maryland Federal Preschool Expansion Grant Application, 2014). Additionally, in 2014, Maryland introduced Ready for Kindergarten (R4K), which measures learning and identifies needs for prekindergarten age children (Readiness Matters, 2016). These efforts reveal Maryland's continued

investment in prekindergarten programs, particularly considering their potential to support school readiness.

The following prekindergarten literature summary, synthesized from the research team's *A Comprehensive Analysis of Prekindergarten in Maryland* (Workman, Palaich, & Wool, 2016), supports Maryland's move toward prekindergarten expansion. The research team also recommends that Maryland provide increased investment to support high-quality childcare centers and family homes, as the return on investment (ROI) justifies the expense. This document will not only outline this recommendation, but it will also share different funding models that would cover its cost.

Summary of Literature Review

Published research overwhelmingly favors prekindergarten programs, citing both their short- and long-term benefits. While the academic benefits of prekindergarten stand out, especially the positive correlation with school readiness, evidence of other holistic benefits, such as social and emotional competence, also exist. Indeed, Yoshikawa et al. (2013, p. 13) assert that, "high-quality early childhood education programs are among the most cost-effective educational interventions, and are likely to be profitable investments for society as a whole." Providing quality prekindergarten programs, therefore, contributes to a state's general welfare.

In terms of academics, quality prekindergarten programs build the skills children need to be school-ready. For every year spent in prekindergarten, children get an average gain of, "about a third of a year of additional learning across language, reading, and math skills," though gains can be as high as a full year of additional learning in math and reading (Yoshikawa et al. 2013, p. 1). Maryland's R4K assessment results corroborate this assertion, showing significant increases in school-readiness for children who attend prekindergarten programs. The initiative's 2015-16 A Kindergarten Readiness Assessment (KRA), which measures school-readiness behaviors, finds that 44 percent of children enrolled in a public prekindergarten program demonstrate school-readiness, compared to 29 percent of children enrolled in home or informal care settings (Readiness Matters, 2016). Additionally, the KRA asserts that those who attend public prekindergarten outperform their peers at the same income level by 44 percent to 33 percent. As a result, in Maryland, prekindergarten programs are already yielding school-readiness and narrowing the achievement gap.

Other landmark research on prekindergarten effectiveness, especially a study published in *JAMA* in 2014, corroborates the positive correlation between prekindergarten and school-readiness that exists in Maryland. Using the readiness standards outlined in Teaching Strategies GOLD (TS GOLD), this 2014 study focuses on more holistic domains of school-readiness, such as socio-emotional and cognitive development, in addition to literacy and math. Researchers found that, "a full-day preschool intervention was associated with increased school readiness skills in four of six domains, and that attendance and reduced chronic absences compared with a part-day program" (Reynolds et al., 2014). While this study focused on comparing full- and half-day programs, these findings still effectively demonstrate the positive link between prekindergarten programs and school-readiness skills and behaviors.

Beyond academic gains, children who attend prekindergarten programs are more likely to be contributing members of society. Studies show that children with higher school-readiness levels are healthier, less likely to be caught up in the criminal justice system, and are more likely to stay in school (Readiness Matters, 2016, p. 1). As a result, these students also typically attain higher levels of education and earn higher wages later in life. The effect of prekindergarten on school readiness, therefore, has lasting positive implications. Accordingly, access to universal prekindergarten programs represents a worthy and profitable goal.

Additionally, students with greater school readiness may positively impact kindergarten through grade 12 funding in the future. For example, research shows that these students require smaller investments in compensatory and special education, while also increasing base costs if prekindergarten programs yield fewer dropouts and higher graduation rates. Findings from the Chicago Child-Parent Center Program (CPC) and the High Scope Perry Preschool Project (the Perry Project) corroborate this assertion. For the CPC program, “participants had 29 percent higher high school graduation rates, 41 percent lower rates of enrollment in special education, 33 percent lower rates of juvenile detention, 42 percent lower rates of ‘violent offense’ arrests, and 51 percent lower rates of child maltreatment” (Rice University Center for Education, 2012, para. 4). Data from the Perry Project also suggests that greater school readiness affects kindergarten through grade 12 future funding. Following up with students at age 27, data reveals that compared to non-participants, Perry Project participants had finished, on average, one more year of school than non-participants; had spent, on average, 1.3 fewer years in special education; had higher graduation rates (65 percent compared to 45 percent); and had half as many teenage pregnancies (Coalition for Evidence-Based Policy, 2015). Data from both programs, therefore, suggest that prekindergarten programs can save school systems money in the future, as students who attend these programs demonstrate school-readiness skills that can mitigate the need for special services. These skills can also encourage higher graduation rates, thus allowing prekindergarten students to become positive contributors to society.

For a state to truly reap the benefits of universal prekindergarten, however, programs must be considered high-quality. As cited in the research team’s original report, high-quality programs yield higher benefits because of desirable factors, including but not limited to: 1) smaller class sizes; 2) smaller student-to-teacher ratios (and, as a result, warmer and more responsive teacher-student interactions); 3) higher teacher qualifications and credentials; 4) higher teacher and staff pay; and 5) greater professional support for teachers and staff (Yoshikawa et al., 2013, 6). This research implies that effective prekindergarten services should include these determinants of high-quality programs, or the positive effects of prekindergarten will be significantly diminished. For Maryland, therefore, it is important that the State commits not just to universal prekindergarten coverage, but also to supporting the highest quality programs.

Recommendation

Currently, Maryland uses a Quality Rating and Improvement System (QRIS) called EXCELS to accredit prekindergarten providers. Given the importance of quality prekindergarten programs, the research team defines “high-quality” as a public or private program that earns an EXCELS Level 5 rating. According

to the original report's "Estimated Capacity, Cost, and Benefit of Current Prekindergarten System" table, Maryland has the current capacity for 32,651 four-year-old children to attend prekindergarten at a Level 5 rated site or accredited child care, family home, or public program (Workman et al. 2016, p. 62). However, the research team also asserts that 27,713 additional high-quality slots are needed to meet the goal of 80 percent enrollment, which is considered universal coverage for opt-in, high-quality programs. To account for this difference between supply and demand, the research team recommends that Maryland provide increased investment to support childcare centers and family homes earning high-quality status, as the return on investment (ROI) justifies the expense.

To realize the goal of 80 percent enrollment of four-year-olds in a high-quality kindergarten, the cost to the state would be \$675 million. Compared to the current system, this universal high-quality prekindergarten scenario costs an additional \$141 million. Although the state would have to pay the initial \$675 million investment, the benefits will total over \$3.7 billion, with an ROI of \$5.54 for every dollar invested, a 27 percent increase over the current system ROI (Workman et al. 2016, p. 78). The study team believes that the increased ROI justifies the increased investment in quality prekindergarten.

To fund this endeavor, the study team suggests the possibility for shared investment. In the state-local share model, the costs of expanding to universal prekindergarten would be shared between state and local school districts. Benefits of this model include 1) ease of administration and budgeting, 2) quality level-based funding for providers, 3) aligned funding allocations to Maryland's current school finance system, 4) single system funding for public and private providers, and 5) shared support for prekindergarten expansion (Workman et al. 2016, p. 85). The second model proposes that costs are shared between the State and local school districts, as well as participating families based on means testing. The benefits of this system align closely with the benefits of the state share model. Such a system also includes families that are financially able to contribute based on their ability to pay, resulting in a lower cost to the State and local school district for supporting lower income families. (Workman et al. 2016, p. 86).

The preceding analysis pertains to the study team's recommendation for providing high-quality prekindergarten for four-year-olds. The study team was also asked to develop an estimate of the cost of providing high-quality prekindergarten services to low-income three-year-olds. This estimate is presented in Appendix E in the supplemental document *Appendices A-E: Final Report of the Study of Adequacy of Funding for Education in Maryland*.

Conclusion

The State of Maryland has already shown a commitment to prekindergarten programs, supported by positive research findings on the relationship between prekindergarten and school readiness. Indeed, students who attend prekindergarten tend to be more prepared for school, show positive socio-emotional and behavioral skills, have higher attendance, and require fewer services, such as special education and criminal justice, throughout their lives. As such, students who attend prekindergarten both save money and contribute to society, representing a significant return on investment. Universal prekindergarten, therefore, is a valuable investment. Although Maryland has programs in place to

encourage expanded prekindergarten access, there is a gap between the current number of high-quality prekindergarten slots and the number needed to reach 80 percent enrollment at high-quality programs. For Maryland to close this gap and achieve universal prekindergarten enrollment, it would need to invest \$675 million. However, this investment would yield a ROI of \$5.54 for every dollar invested. The study team also recommends this investment be shared across stakeholders, to both share the cost and maximize stakeholder engagement.

Supplemental Grants

In 2007, the Maryland General Assembly authorized the Supplemental Grant program for school districts to “mitigate the effect of the freeze in the per pupil foundation amount for fiscal 2009 and 2010, ensuring at least a 1 percent annual increase in state funding for each local school system based on a formula established in the law” (Department of Legislative Services, 2014, p. 80). The grant program exists to ensure that all school systems receive at least a minimal amount of increase in state education aid. After its enactment in 2007, the Supplemental Grant program was amended twice. First, in 2009, the grant amounts were reduced for fiscal years 2011 and beyond to correct for a miscalculation of state aid in 2009 and 2010. Then, in 2013, a provision was enacted mandating that no grants may be less than zero, eliminating the negative grant amounts that were being charged to Carroll and Harford Counties. Between 2009 and 2015, accounting for the reductions described above, the State of Maryland spent \$310,528,888 in total on the supplemental grants program. Table 7.4 below details Maryland’s spending on supplemental grants between 2009 and 2015, organized by school district and year.

Table 7.4: Observed Supplemental Grant Allocations, by District, by Year

	2009	2010	2011	2012	2013	2014	2015	Totals
Allegany	-	\$443,985	\$10,348	\$10,348	\$10,348	\$10,348	\$10,348	\$495,725
Anne Arundel	-	-	-	-	-	-	-	-
Baltimore City	\$25,076,647	\$18,310,933	\$18,310,933	\$18,310,933	\$18,310,933	\$18,310,933	\$18,310,933	\$134,942,245
Baltimore County	-	-	-	-	-	-	-	-
Calvert	-	-	-	-	-	-	-	-
Caroline	-	\$1,326,173	\$966,820	\$966,820	\$966,820	\$966,820	\$966,820	\$6,161,273
Carroll	-	\$502,149	(\$117,565)	(\$117,565)	(\$117,565)	-	-	\$149,454
Cecil	-	\$520,250	\$49,060	\$49,060	\$49,060	\$49,060	\$49,060	\$765,550
Charles	-	-	-	-	-	-	-	-
Dorchester	-	\$1,662,399	\$1,321,515	\$1,321,515	\$1,321,515	\$1,321,515	\$1,321,515	\$8,269,974
Frederick	-	-	-	-	-	-	-	-
Garrett	\$514,217	\$1,201,160	\$1,201,160	\$1,201,160	\$1,201,160	\$1,201,160	\$1,201,160	\$7,721,177
Harford	-	\$971,599	(\$6,102)	(\$6,102)	(\$6,102)	-	-	\$953,293
Howard	-	-	-	-	-	-	-	-
Kent	\$482,608	\$1,003,414	\$1,003,414	\$1,003,414	\$1,003,414	\$1,003,414	\$1,003,414	\$6,503,092
Montgomery	-	-	-	-	-	-	-	-
Prince George's	-	\$20,574,031	\$20,505,652	\$20,505,652	\$20,505,652	\$20,505,652	\$20,505,652	\$123,102,291
Queen Anne's	-	-	-	-	-	-	-	-
St. Mary's	-	\$4,683,265	\$3,251,181	\$3,251,181	\$3,251,181	\$3,251,181	\$3,251,181	\$20,939,170
Somerset	\$525,644	-	-	-	-	-	-	\$525,644
Talbot	-	-	-	-	-	-	-	-
Washington	-	-	-	-	-	-	-	-
Wicomico	-	-	-	-	-	-	-	-
Worcester	-	-	-	-	-	-	-	-
Statewide Total	\$26,599,116	\$51,200,358	\$46,496,416	\$46,496,416	\$46,496,416	\$46,620,083	\$46,620,083	\$310,528,888

Source: Data provided by the Maryland State Department of Education.

Recommendation

The research team's *A Comprehensive Review of State Adequacy Studies Since 2003* (2014) reviewed 39 adequacy studies, including two previous studies completed for Maryland in 2001. This initial review aimed to set a foundation of best practices for the current comprehensive adequacy study. Supplemental grants or hold-harmless provisions played a negligible role in the studies reviewed.

For the current adequacy study the research team used three approaches to estimating adequacy: the successful schools/districts (SSD) approach, which analyzes spending in districts that are currently meeting state standards; the professional judgment (PJ) approach, which relies on professionals to specify the resources needed for a representative district and schools to meet state standards; and the evidence-based (EB) approach, which relies on research findings to design a prototypical district and schools to estimate an adequacy amount. The immediate use of the results from the PJ and EB studies (or their combination) would eliminate the need for the Supplemental Grants program altogether. Consideration of a phase-in approach to implementing the study's recommendation would likely require the retention of a hold harmless program to help certain districts make the transition before the recommended base cost and new weights were completely phased-in.

As a result, the study team concludes that the Supplemental Grant program in its current form is no longer needed. Further, a hold harmless program may be needed during a phase in of this report's recommendation. The size and nature of that program should be developed once the phase-in parameters are set. Once the recommendations are fully implemented, the hold-harmless program should also be eliminated.

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