Commission on Innovation and Excellence in Education

William E. Kirwan, Chair

Agenda
December 8, 2016
10:00 a.m.-4:00 p.m.
120 House Office Building, Annapolis, Maryland

I. Chair's Opening Remarks

II. Final Report on Adequacy of Education Funding in Maryland

- Robert Palaich, Augenblick, Palaich and Associates (APA) Consulting
- Justin Silverstein, APA Consulting
- Mark Fermanich, APA Consulting

12:30-1:15 p.m. Lunch Break – Lunch will be provided for the Commission in Room 180

III. Adequacy Funding and Education Expenditures Since 2002

- Rachel Hise and Scott Gates, Department of Legislative Services (DLS)
- Erika Schissler, Kyle Siefering, and Eric Pierce, DLS

IV. *No Time to Lose* Report and Next Steps

- Julie Bell, National Conference of State Legislatures
- Betsy Brown Ruzzi, National Center on Education and the Economy

V. Discussion of Interim Report and 2017 Meetings

VI. Chair's Closing Remarks and Adjournment

Next Meeting: Monday, January 9, 2017 – 1:00 p.m. to 5:00 p.m. – 120 House Office Building

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

Prepared for

Maryland State Department of Education

By

APA Consulting

November 30, 2016

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.

Suggested Citation: Augenblick, Palaich & Associates. (2016). *Final Report of the Study of Adequacy of Funding for Education in Maryland*. Denver, CO: Author.

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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 eligible[4] 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 EXCELS[6] 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 all 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 indices[11]. 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 target[12]. 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 qualify 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 analysis[14] 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: (total program X 0.50)/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 30th FTE enrollment count for the prior school year.	A district would receive the greater of two counts — the prior year's September 30th 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%**

[1]Current 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%**

[1]Current 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-WV[25]. 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: 33⅓ 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	Current Evidence-Based Formula Ratio or Dollar Per Pupil Figure
Dollar Per Student Resources	
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 Equipment[32]	$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 3⅓ 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 3⅓ 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 Model Administrator	 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 0perations (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, EBPJ 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
Note that the evidence-based special education weight presented is only for mild and moderate special education students.	

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 specials 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 alterative-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
Instructional Staff	
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
Pupil Support Staff	
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
Administrative Staff	
Principal	1.0
Assistant Principals	2.0
Bookkeeper	1.0
Clerical	2.0
Other Staff	
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
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
In-School Suspension Instructors	1.0
Alternative-to-Suspension Instructors	1.0
Administrative Staff	
Principal	1.0
Assistant Principals	4.0
Athletic/Activities Director	1.0
Bookkeeper	1.0
Clerical	5.0
Other Staff	
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 *Before 50 Percent At Risk Concentration Level is Reached*	**Before- or After-School** *Once 50 Percent At Risk Concentration Level is Reached*	**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

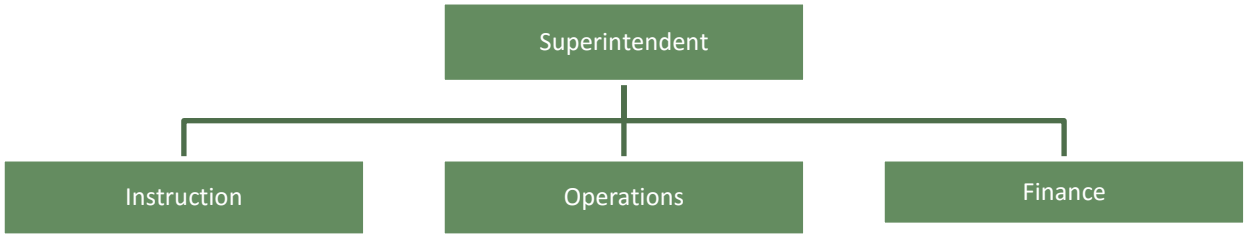
Hardware Item	# of Units Needed
Administration/Main Office	
Computers	1 per office staff member
Laptops	1 per administrator
Mobile Device	1 per administrator
Printers	2 total
Copier/Printer	5 total
Cell Phone	1 per administrator
Faculty	
Laptops	1 per professional
Mobile Device	1 per professional
Classroom	
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



Instruction	Operations	Finance
Instructional Tech/IT	Food Service	Purchasing
Student Services	Transportation	Budgeting
Curriculum	Facilities	Accounting
Data, Research and Accountability	Legal	Payroll
School Admin.	Human Resources/ Benefits	Accounts-Receivable
Athletics/Activities	Capital Planning	Accounts-Payable
Student Behavior	Construction	Grants
Digital Learning	Security	Internal Audit
Minority Achievement	Public Relations	Insurance
Student Health	Warehouse	
CTE		

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 weight[37]).

[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 x 0.67)+(1.35 x 0.25)+(3.62 x 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 pervious 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 pupil[42] 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 with 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.

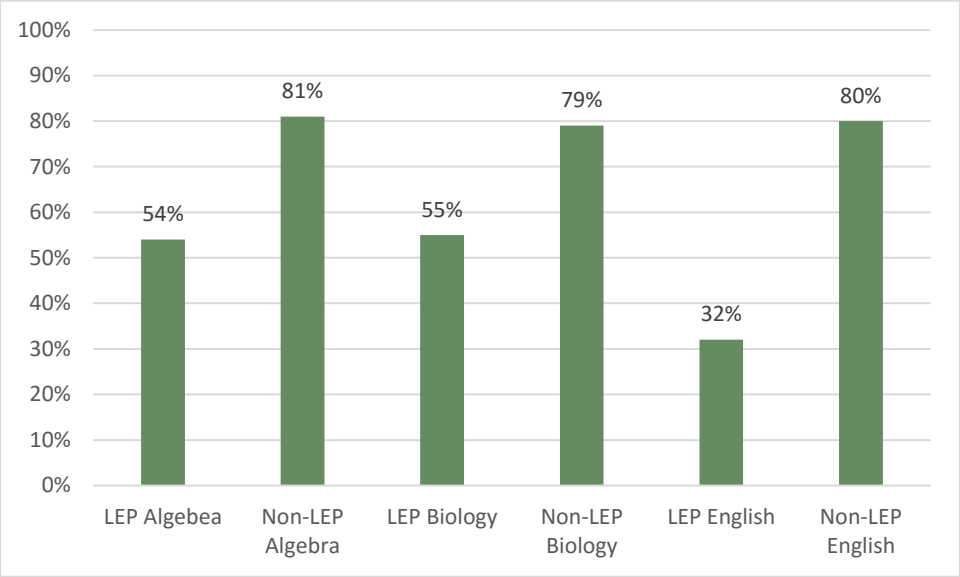
To determine the appropriate blended weight, the study team first looked deeper into the resource allocations in the two models. The study team determined that support services needed for LEP students, as identified in the two approaches, were very similar to the services needed for compensatory education 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 EXCELS[48] 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 all 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 qualify 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 analysis[56] 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: (total program X 0.50)/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 30th FTE enrollment count for the prior school year.	A district would receive the greater of two counts – the prior year's September 30th 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 specials 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

	Total Program			
Local Unit	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%

[1]Current 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%

[1]Current 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*

	Total State Share				Total Local Share			
Local Unit	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%)

	Total State Share				Total Local Share			
Local Unit	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%**

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

[2]Current 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.

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

[4]The 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%**

[1]Current 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%**

[1]Current 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%**

[1]Current 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*

	Total State Share				Total Local Share			
Local Unit	**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%**

[1]Current 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*

	Total Program				Total State Share			
Local Unit	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%)

	Total Program				Total State Share			
Local Unit	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%)**

[1]Current 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*

	Total Program				Total State Share			
Local Unit	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%)

	Total Program				Total State Share			
Local Unit	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%)**

[1]Current 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*

	Total Program				Total State Share			
Local Unit	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%)

	Total Program				Total State Share			
Local Unit	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%**

[1]Current 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-WV[67]. 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 then 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 exits 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" (Michelmore & 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 criteria[71] 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, Reijnevald 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 student[73]. 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. Yoshiba 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.

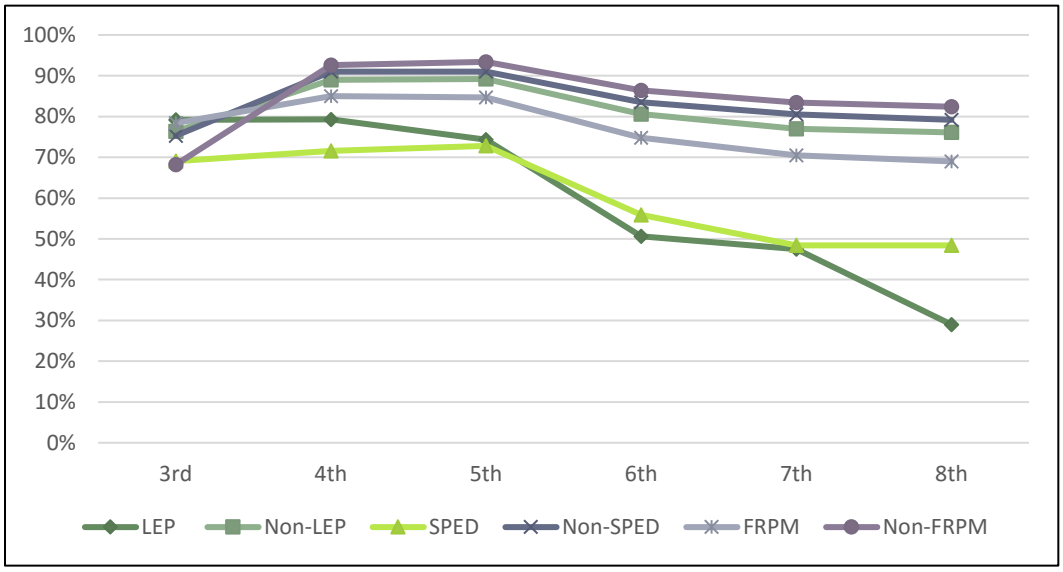
[74] LEP students have been referred to as LEP students throughout this report. The student populations are the same, but as Maryland assessment results use the ELL category, this report and the following report will use the LEP title.

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%

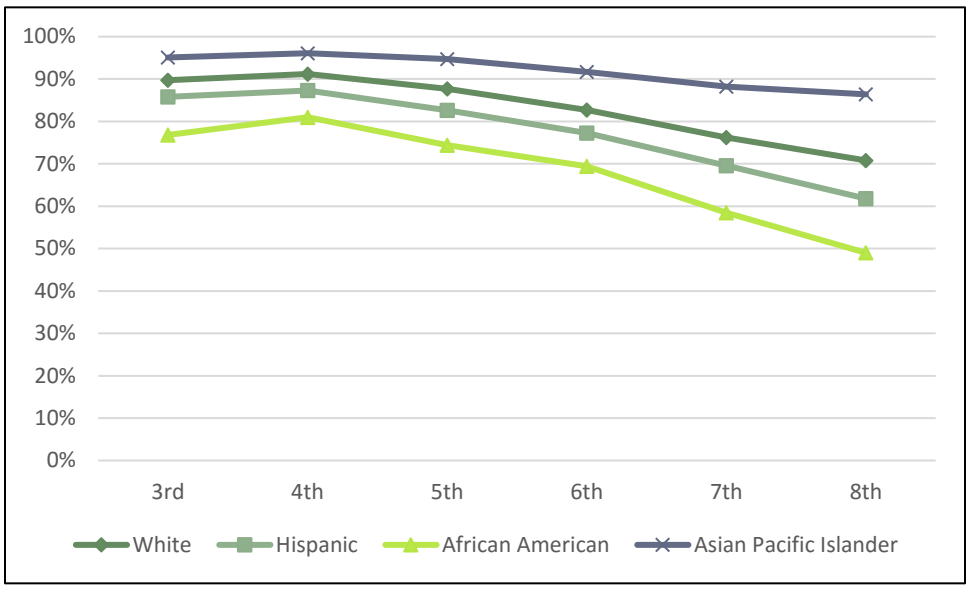
Across all grades, the average percentage of students who qualify as FRPM and special education in 2012 were 44 percent and 11 percent, respectively. However, in 2012, there are only two percent of LEP students in eighth grade and 10 percent in grade three. This trend was expected because students should 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

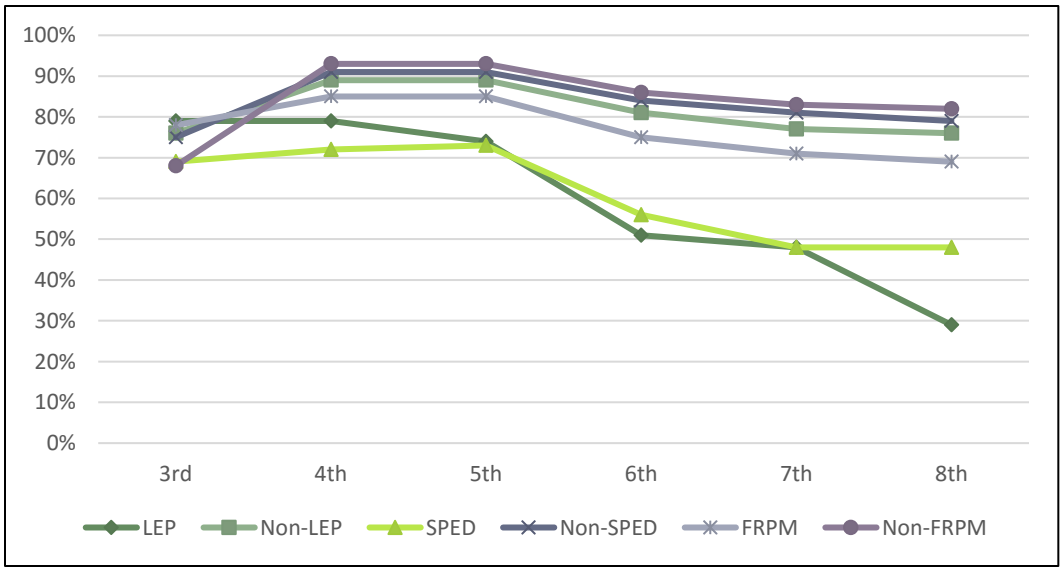
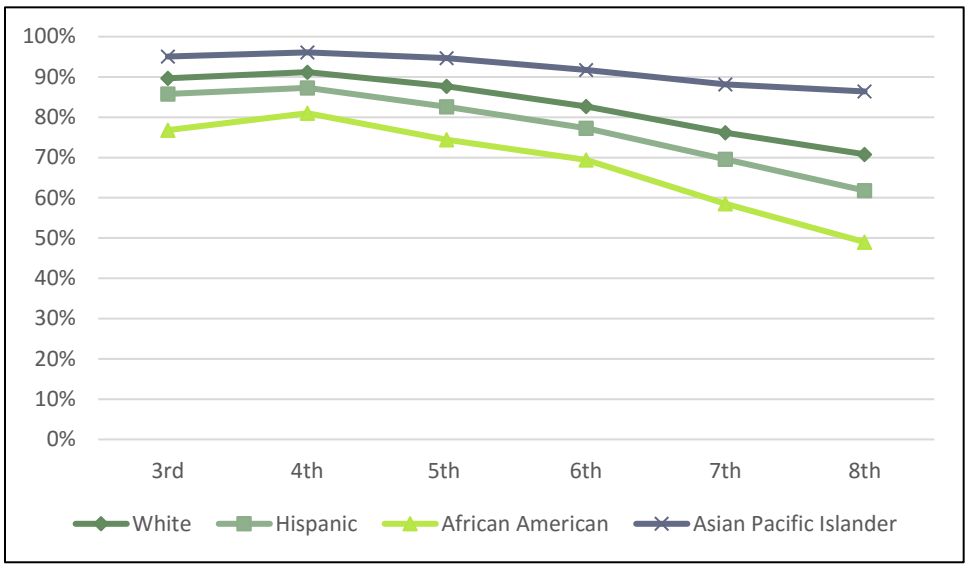


Figure 7.4
Average Percentage of Students Proficient in Math by Race and Grade



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

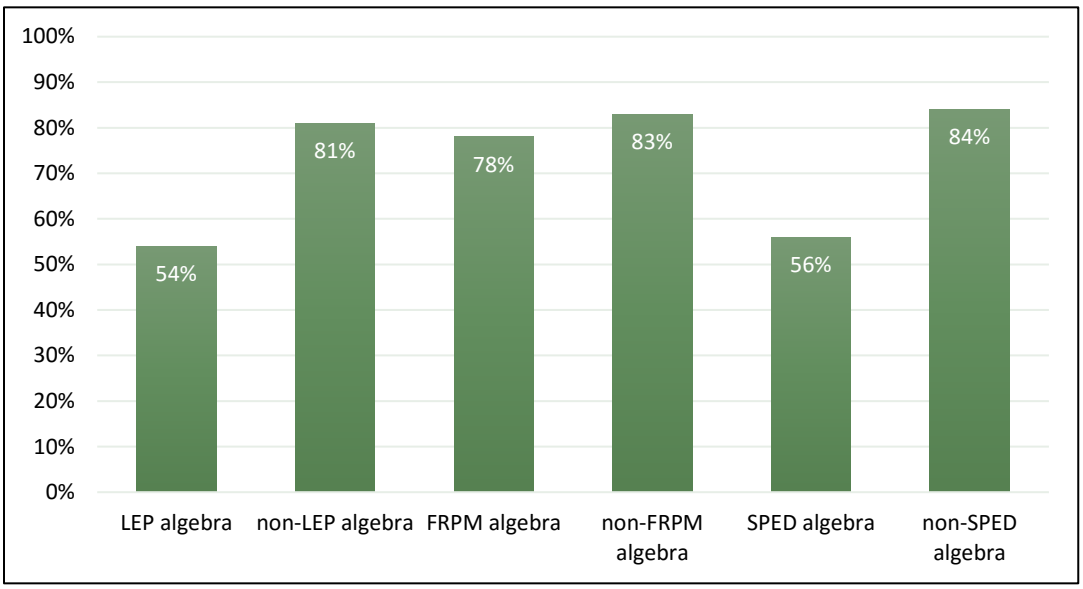
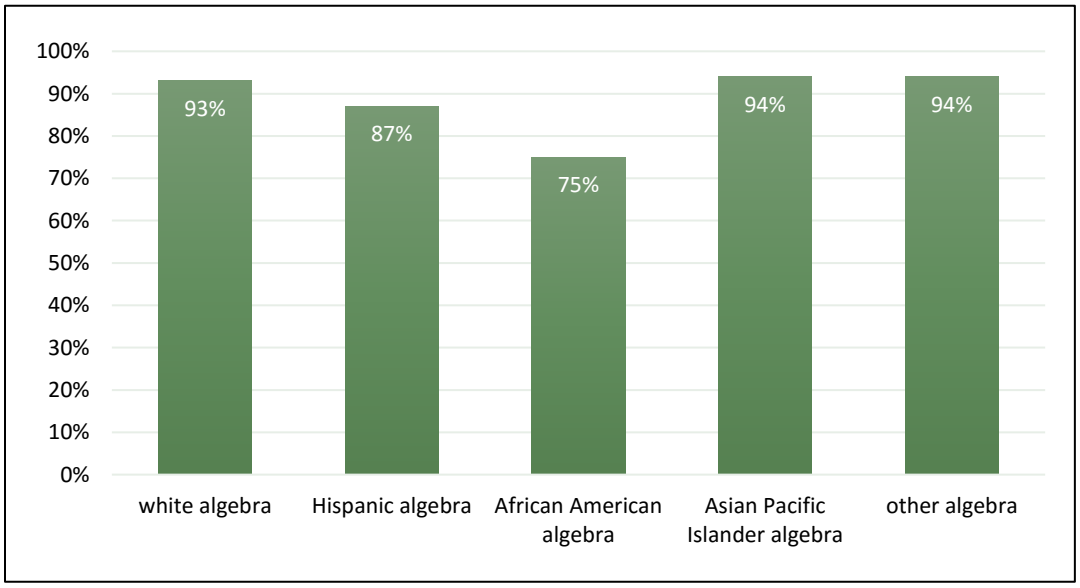


Figure 7.6
Average Percentage of High School Students Proficient in Algebra by Race



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

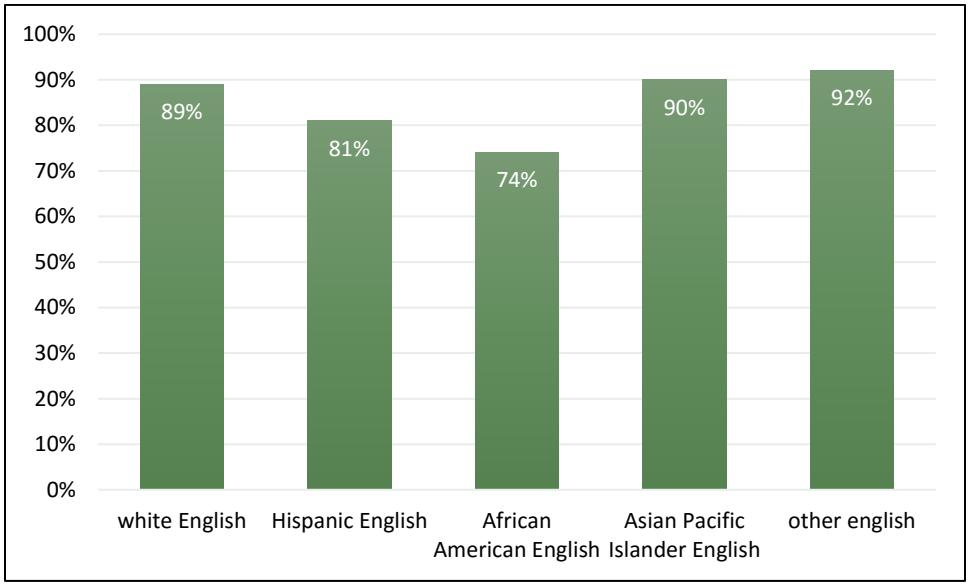
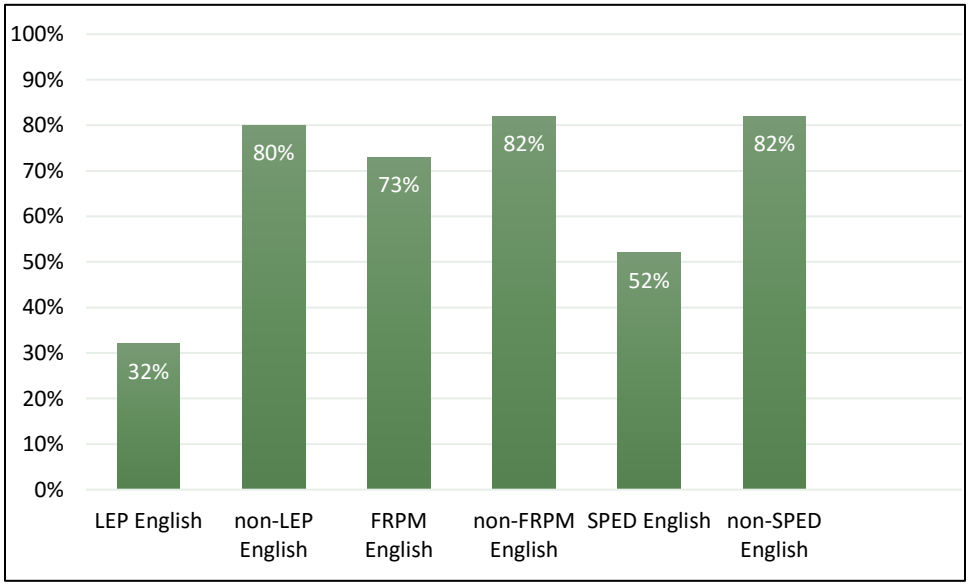


Figure 7.8
Average Percentage of High School Students Proficient in English by Subgroup



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 level[77] 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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Appendices A-E

FINAL REPORT OF THE STUDY OF ADEQUACY OF FUNDING FOR EDUCATION IN MARYLAND

Prepared for

Maryland State Department of Education

By

APA Consulting

AUGENBLICK, PALAICH AND ASSOCIATES

Picus Odden & Associates

MARYLAND EQUITY PROJECT
ADVANCING EDUCATIONAL OPPORTUNITIES

November 30, 2016

Contents

Appendix A

Previously Released Reports

Below is a list of suggested citations for previously released reports for the Maryland adequacy study. All the information (meeting information, reports, and supplemental materials) pertaining to the study can be found at http://marylandpublicschools.org/Pages/adequacystudy/index.aspx**.**

Aportela, A., Picus, L., Odden, A. & Fermanich, M. (2014). *A Comprehensive Review of State Adequacy Studies Since 2003.* Denver, CO: Augenblick, Palaich & Associates. Retrieved at: http://marylandpublicschools.org/Documents/adequacystudy/AdequacyReviewReport_rev_091214.pdf

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Appendix B

Professional Judgment Panel and Evidence-Based Panel Materials

Appendix B.1: Professional Judgment Panel and Evidence-Based Panel Membership and Participants

Table B.1
CHARACTERISTICS AND COUNTS OF MARYLAND PROFESSIONAL JUDGMENT PANEL PARTICIPANTS

Panel Type						Numbers of Participants by Role								
Panel Number	Level	School Type	Student Type	Time Needed (Days)	Location of Panel Meeting	Teacher/ Coordinator	Principal	District Superintent or Instructional Leader	Director of Special Ed, ELL, ECE or Student Services	Tech Specialist or Director	CFO or Business Manager	School Board Member	Representative of MSDE, the Division of Early Childhood Development (Office of Childcare)	**Total Participants per Panel**
1	School	Preschool	Regular, At-Risk	1.0	Balt.	2 Preschool Teachers/Coordinators	3 Elementary Principals	1	1 Director of Preschool /ECE		1		1	**9**
2	School	Elementary	Regular, At-Risk	1.5	Balt.	2 Elementary Teachers	3 Elementary Principals	1		1	1			**8**
3	School	Middle	Regular, At-Risk	1.5	Balt.	2 Middle School Teachers	3 Middle School Principals	1		1	1			**8**
4	School	High School	Regular, At-Risk	1.5	Balt.	2 High School Teachers	3 High School Principals	1		1	1			**8**
5	Special Need	Elementary, Middle, HS	ELL	1.0	Balt.	1 Elementary ELL Lead Teacher Coordinator 1 Middle School ELL Lead Teacher/Coordinator 1 High School ELL Lead Teacher/Coordinator	1 Elementary Principal, 1 Middle School Principal, 1 High School Principal	1	1 Director of ELL		1			**9**
6	Special Need	Elementary, Middle, HS	Special Education	1.0	Balt.	1 Elementary SpEd Lead Teacher/Coordinator 1 Middle School SpEd Lead Teacher/Coordinator 1 High School SpEd Lead Teacher/Coordinator	1 Elementary Principal, 1 Middle School Principal, 1 High School Principal	1	1 Director of Special Ed		1			**9**
7	District	All	All	2.0	Balt.	1	1 Elementary Principal, 1 Secondary Principal	3	1 Director of Student Services	1	1	1		**10**
8	CFO	All	All	1.0	Balt.						6			**6**
9	Statewide	All	All	1.0	Balt.	1	1 Elementary Principal, 1 Secondary Principal	3	1		2	1		**10**
TOTAL PARTICIPANTS						***16***	***22***	***12***	***5***	***4***	***15***	2	***1***	***77***

Table B.2
CHARACTERISTICS AND COUNTS OF MARYLAND EVIDENCE-BASED PROFESSIONAL JUDGMENT PANEL PARTICIPANTS

Panel Type						Numbers of Participants by Role								
Panel Number	Level	School Type	Student Type	Time Needed (Days)	Location of Panel Meeting	Teacher/ Coordinator	Principal	District Superintent or Instructional Leader	Director of Special Ed, ELL, ECE or Student Services	Director or Assistant Supt. of Curriculum	Tech Specialist or Director	CFO or Business Manager	School Board Member	**Total Participants per Panel**
1	Multiple	Multiple	All	1.5	North Bel Air	1 Elementary Teacher 1 Middle School Teacher 1 High School Teacher 1 Preschool Teacher 1 SpEd Teacher 1 ELL Teacher 1 Lead Teacher - for example teacher team leader 1 Instructional Coach 1 Tutor	1 Elementary Principal 1 Middle School Principal 1 High School Principal	1	2	1	1	1	1	**19**
2	Multiple	Multiple	All	1.5	South Largo	1 Elementary Teacher 1 Middle School Teacher 1 High School Teacher 1 Preschool Teacher 1 SpEd Teacher 1 ELL Teacher 1 Lead Teacher - for example teacher team leader 1 Instructional Coach 1 Tutor	1 Elementary Principal 1 Middle School Principal 1 High School Principal	1	2	1	1	1	1	**19**
3	Multiple	Multiple	All	1.5	East Chester-town	1 Elementary Teacher 1 Middle School Teacher 1 High School Teacher 1 Preschool Teacher 1 SpEd Teacher 1 ELL Teacher 1 Lead Teacher - for example teacher team leader 1 Instructional Coach 1 Tutor	1 Elementary Principal 1 Middle School Principal 1 High School Principal	1	2	1	1	1	1	**19**
4	Multiple	Multiple	All	1.5	West Cumber-land	1 Elementary Teacher 1 Middle School Teacher 1 High School Teacher 1 Preschool Teacher 1 SpEd Teacher 1 ELL Teacher 1 Lead Teacher - for example teacher team leader 1 Instructional Coach 1 Tutor	1 Elementary Principal 1 Middle School Principal 1 High School Principal	1	2	1	1	1	1	**19**
TOTAL PARTICIPANTS						***36***	***12***	***4***	***8***	***4***	***4***	***4***	***4***	***76***

Table B.3
PROFESSIONAL JUDGMENT PANEL PARTICIPANTS

Panel	LEA	Role	First Name	Last Name	Title
CFO	Carroll	CFO or Business Manager	Chris	Hartlove	Chief Financial Officer
	Frederick	CFO or Business Manager	Leslie	Pellegrino	Central Office
	Garrett	CFO or Business Manager	Larry	McKenzie	Director of Finance
	Prince George's	CFO or Business Manager	John	Pfister	Director of Budget and Management Services
	Queen Anne's	CFO or Business Manager	Robin	Landgraf	CFO, CO
	St. Mary's	CFO or Business Manager	Tammy	McCourt	Assistant Superintendent, Finance
District	Frederick	District Superintendent or Instructional Leader	Kevin	Cuppett	Central Office
	Garrett	District Superintendent or Instructional Leader	Barbara	Baker	Assistant Superintendent of Educational Services
	Carroll	CFO or Business Manager	Chris	Hartlove	Chief Financial Officer
	Kent	Director of Student Services	Darlene	Spurrier	Supervisor of Student Services
	Washington	Tech Specialist or Director	Jim	Corns	Chief Operations Officer Instructional Technology
	Anne Arundel	Principal	Nuria	Williams	Principal, Crofton
	Howard	Principal	James	LeMon	Principal, Wilde Lake HS
	Baltimore County	Teacher/Coordinator	Orly	Mondell	Teacher, New Town High School
	MABE	Board Member	William	Phalen	Board Member
ELL	Dorchester	Director of ELL	Theresa	Connors	Supervisor of English/ELL
	Frederick	Principal	Kathy	Swire	Myersville Elementary
	Harford	Principal	Larissa	Santos	Principal/Edgewood
	Washington	Principal	James	Aleshire	Principal, North Hagerstown High
	Anne Arundel	Teacher/Coordinator	Cheryl	Menke	Teacher Specialist
	Cecil	Teacher/Coordinator	Enid	Lum	Teacher, ESOL multi-school
	Montgomery	Teacher/Coordinator	Sonja	Bloetner	Secondary ESOL

Panel	LEA	Role	First Name	Last Name	Title
Elementary	Washington	District Superintendent or Instructional Leader	Peggy	Pugh	Associate Superintendent for Curriculum and Instruction
	Calvert	Tech Specialist or Director	Jon	McClellan	Director of Instructional and Informational Technology
	Harford	CFO or Business Manager	Eric	Clark	Director of Budget
	Harford	Principal	Patty	Mason	Principal/Magnolia
	Howard	Principal	Maisha	Strong	Principal, Swansfield ES
	Kent	Principal	Dawn	VanGrin	Principal of Galena Elementary
	Allegany	Teacher/Coordinator	Dana	Reinhardt	Third Grade Teacher - George's Creek Elementary School; 2014-15 Teacher of the Year
	Baltimore City	Teacher/Coordinator	Katrina	Kickbush	Wolfe Street Academy
High School	Cecil	District Superintendent or Instructional Leader	Carolyn	Teigland	Assoc. Supt for Education Services
	Garrett	Tech Specialist or Director	Jeff	Gank	Director of Information Technology
	Howard	CFO or Business Manager	Beverly	Davis	Executive Director, Budget and Finance
	Allegany	Principal	Stephanie	Wesolowski	Assistant Principal/Academic Dean - Mountain Ridge High School
	Somerset	Principal	Sidney	Hankerson	Principal (Washington H. S.)
	Baltimore County	Teacher/Coordinator	Sean	McComb	ELA, Patapsco High School and Center for the Arts
	Prince George's	Teacher/Coordinator	Effie	Hillian	English Dept. Chair, Oxon Hill High School
Middle School	Anne Arundel	District Superintendent or Instructional Leader	Jolyn	Davis	Director, School Performance
	Caroline	CFO or Business Manager	Erin	Thornton	Comptroller
	Caroline	Teacher/Coordinator	Heather	Harper	Teacher, Colonel Richardson Middle School
	Howard	Tech Specialist or Director	Shelly	Barnett	Manager, Enterprise Systems
	Allegany	Principal	Tessa	Fairall	Assistant Principal at Washington Middle School
	Baltimore City	Principal	Najib	Jammal	Principal, Lakeland Elem./Middle
	Montgomery	Principal	Monifa	McKnight	Ridgeview MS
	Washington	Teacher/Coordinator	Jaime	Mason-Lego	2010 Teacher of the Year, Clear Spring Middle

Panel	LEA	Role	First Name	Last Name	Title
PreK	Baltimore City	Director of Early Childhood	Perry	Gergen	Director of Early Education
	Washington	CFO or Business Manager	Eric	Sisler	Financial Budget Analyst
	Worcester	Tech Specialist or Director	Thomas	Mascara	Director, Technology
	Garrett	Principal	Candy	Maust	Route 40 Elementary
	Montgomery	Principal	Annette	Folkes	Roscoe Nix Elementary
Special Education	Calvert	District Superintendent or Instructional Leader	Daniel	Curry	Superintendent of Schools
	Carroll	Principal	Craig	Dunkelberger	Principal, Piney Ridge Elem.
	Queen Anne's	Principal	Amy	Hudock	Principal, CMS
	Garrett	Teacher/Coordinator	Katie	Lauder	Special Ed. Teacher
	Somerset	Teacher/Coordinator	Fern	Griffith	Special Ed. Teacher
	Worcester	Teacher/Coordinator	Jenifer	Heimer	Snow Hill Middle School
Statewide	Harford	District Superintendent or Instructional Leader	Barbara	Canavan	Superintendent
	Montgomery	District Superintendent or Instructional Leader	Maria	Navarro	Chief Academic Officer
	Queen Anne's	District Superintendent or Instructional Leader	Carol	Williamson	Superintendent
	St. Mary's	CFO or Business Manager	Tammy	McCourt	Assistant Superintendent, Finance
	Wicomico	CFO or Business Manager	Bruce	Ford	Business Manager
	Carroll	Principal	Eric	King	Principal, Winters Mill HS
	Frederick	Principal	Jenny	Powell	Thurmont Middle
	Baltimore City	Teacher/Coordinator	Ryan	Kaiser	Teacher of the Year
	MABE	Board Member	Christopher	Barclay	Board Member, Montgomery

Table B.4
EVIDENCE-BASED PROFESSIONAL JUDGMENT PANEL PARTICIPANTS

Panel	Role	District	First Name	Last Name
East	Elem.	Kent County	Tracy	Hodge
East	ELL	Prince George's County	Kristen	Ford
East	High	Dorchester County	Julie	Harp
East	Lead	Dorchester County	Natalie	Taylor
East	Middle	Wicomico County	Chad	Pavlekovich
East	Sped.	Anne Arundel County	Jenna	Freiberg
North	Elem.	Howard County	Maleeta	Kitchen
North	ELL	Montgomery County	Tamara	Henneman
North	High	Harford County	Amanda	Roberts
North	Lead	Harford County	Kelly	Mangum
North	Middle	Baltimore County	Barbara	Noppinger
North	Sped.	Prince George's County	Kelly	Moffett
South	Elem.	Charles County	Taniesha	Goulbourne
South	ELL	Montgomery County	Susan	Nerlinger
South	High	Calvert County	Jamie	Culp
South	Lead	Prince George's County	Timonious	Downing
South	Middle	Charles County	Joseph	Farrell
South	Sped.	Montgomery County	Shannon	Mitchell
West	Elem.	Washington County	Megan	Cornelius
West	ELL	Washington County	Nitzalis	Rivera
West	High	Carroll County	Jennifer	Wennell
West	Lead	Carroll County	Thomas	McHugh
West	Middle	Allegany County	Deborah	Jackson
West	Sped.	Frederick County	Pamela	Adams-Campbell

Panel	Role	District	First Name	Last Name
East	After-school or extended learning professional	Dorchester County Public Schools	Regina	Teat
East	CFO or Business Manager	Worcester County Public Schools	Vince	Tolbert
East	Director of sped, ELL, SS, or ECE	Anne Arundel County Public Schools	Bobbi	Pedrick
East	Director of sped, ELL, SS, or ECE	Anne Arundel County Public Schools	Kelli	Reider
East	Director or Assistant Supt. of Curriculum	Queen Anne's County Public Schools	Anne	Thomas
East	District Superintendent, Chief Academic Officer or other Instructional Leader	Somerset County Public Schools	Tom	Davis
East	Elementary School Principal	Queen Anne's County Public Schools	Michelle	Carey
East	High School Principal	Dorchester County Public Schools	Lynn	Sorrells
East	Instructional Coach	Somerset County Public Schools	Tony	Bevilacqua
East	Middle School Principal	Somerset County Public Schools	Elizabeth	Marshall
East	Prekindergarten Teacher	Worcester County Public Schools	Lucy	Doherty
East	School Board Member	Worcester County Public Schools	Bob	Rothermel
East	Tech Specialist or Director	Wicomico County Public Schools	Robert	Langan
North	After-school or extended learning professional	Baltimore City Public Schools	Glenn	Starnes
North	CFO or Business Manager	Carroll County Public Schools	Chris	Hartlove
North	Director of sped, ELL, SS, or ECE	Baltimore City Public Schools	Alison	Perkins-Cohen
North	Director of sped, ELL, SS, or ECE	Cecil County Public Schools	Sarah	Farr

Panel	Role	District	First Name	Last Name
North	Director or Assistant Supt. of Curriculum	Cecil County Public Schools	Carolyn	Teigland
North	District Superintendent, Chief Academic Officer or other Instructional Leader	Harford County Public Schools	Barbara	Canavan
North	Elementary School Principal	Baltimore County Public Schools	Jerry (Dwight)	Easterly
North	High School Principal	Cecil County Public Schools	Anne	Gellrich
North	Instructional Coach	Harford County Public Schools	Erin	Schisler
North	Middle School Principal	Harford County Public Schools	Joe	Mascari
North	Prekindergarten Teacher	Baltimore City Public Schools	Jody	Fleury
North	School Board Member	Harford County Public Schools	Nancy	Reynolds
North	Tech Specialist or Director	Baltimore City Public Schools	Bert	Ross
South	After-school or extended learning professional	Howard County Public Schools	Marty	Cifrese
South	CFO or Business Manager	Montgomery County Public Schools	Tom	Klausing
South	Director of sped, ELL, SS, or ECE	Howard County Public Schools	Lisa	Davis
South	Director of sped, ELL, SS, or ECE	Howard County Public Schools	Judy	Pattik
South	Director or Assistant Supt. of Curriculum	Montgomery County Public Schools	Niki	Hazel
South	District Superintendent, Chief Academic Officer or other Instructional Leader	Prince George's County Public Schools	Shawn	Joseph
South	Elementary School Principal	Howard County Public Schools	David	Larner
South	High School Principal	Baltimore County Public Schools	David	Lloyd

Panel	Role	District	First Name	Last Name
South	Instructional Coach	Anne Arundel County Public Schools	Theresa	Gregory
South	Middle School Principal	Howard County Public Schools	Shiney	John
South	Prekindergarten Teacher	Howard County Public Schools	Dawn	Martinec
South	School Board Member	Montgomery County Public Schools	Philip	Kauffman
South	Tech Specialist or Director	Howard County Public Schools	Shelly	Barnett
West	After-school or extended learning professional	Allegany County Public Schools	Kate	Roberts
West	CFO or Business Manager	Garrett County Public Schools	Larry	McKenzie
West	Director of sped, ELL, SS, or ECE	Baltimore County Public Schools	Rebecca	Rider
West	Director of sped, ELL, SS, or ECE	Frederick County Public Schools	Kathy	Hartsock
West	Director or Assistant Supt. of Curriculum	Frederick County Public Schools	Kevin	Cuppett
West	District Superintendent, Chief Academic Officer or other Instructional Leader	Garrett County Public Schools	Janet	Wilson
West	Elementary School Principal	Allegany County Public Schools	Autumn	Eirich
West	High School Principal	Garrett County Public Schools	Jim	Maddy
West	Instructional Coach	Carroll County Public Schools	Jamie	Weaver
West	Middle School Principal	Carroll County Public Schools	James	Carver
West	Prekindergarten Teacher	Baltimore County Public Schools	Susan	Capron
West	School Board Member	Allegany County Public Schools	Edward	Root

Panel	Role	District	First Name	Last Name
West	Tech Specialist or Director	Allegany County Public Schools	Nil	Grove

Appendix B.2: Participant Qualifications for Maryland's Professional Judgment and Evidence-Based Panels: District-Based Panel Participant Qualifications

Below is a list of suggested qualifications for nominating district-based educators to serve on professional judgment and evidence based state, district- and school-level panels. This is a guideline to help the Maryland State Department of Education identify district-based educators who are effective in their positions and knowledgeable about resources necessary to educate all Maryland students to state standards. This is not intended to be an exhaustive or strict list of requirements for participation. Ultimately, it is up to the discretion of the Department to nominate those who it feels are most qualified to successfully fulfill the role of a district representative on the panels.

These are some suggested general guidelines when nominating participants:

- Participants should be experienced. Experience working in more than one school or district is desirable.
- Nominees should be recognized as being successful educators — those who have effectively contributed to the success of their students, schools, and districts.
- Participants should, in the aggregate, represent all regions of the State.
- Where possible, nominate administrators/educators possessing indicators of excellence such as past recognition as administrator or educator of the year (e.g. superintendent of the year, principal of the year, etc.), National Board for Teaching Standards certification, or active involvement or leadership in a professional association.

Below is a list of suggested qualifications for specific positions (or their equivalent):

- District Superintendent or Instructional Leader
    - 7 years of education experience
    - 3 years of district leadership experience

- School Board Member
    - 3 years serving on a school board

- Director or Assistant Superintendent of Curriculum
    - 7 years of education experience
    - 3 years of curriculum development experience

- Chief Financial Officer or Business Manager
    - 7 years of education experience
    - 3 years of school finance experience

- Director of Special Education, Limited English Proficient students, at risk programs, or Student Services
    - 7 years of education experience
    - 3 years of leadership in the specified field of special need

- Director of Prekindergarten or Early Childhood Education Programs
    - 7 years of education experience
    - 3 years of leadership in prekindergarten or early childhood education programs

- Technology Specialist or Director
    - 3 year minimum of experience working in a technology capacity in a school or district
    - Demonstrated knowledge of instructional technology needs for educational achievement

Appendix B.3: Participant Qualifications for Maryland's Professional Judgment and Evidence Based Panels: School-Based Panel Participant Qualifications

Below is a list of suggested qualifications for nominating school-based educators to serve on professional judgment and evidence based state, district- and school-level panels. This is a guideline to help district leaders identify educators who are effective in their positions and knowledgeable about resources necessary to educate all Maryland students to state standards. This is not intended to be an exhaustive or strict list of requirements for participation. Ultimately, it is up to the discretion of Maryland's education leaders to nominate educators who they feel are most qualified to successfully fulfill the role of school-based representatives on the panels.

These are some suggested general guidelines when nominating participants:

- Participants should be experienced. Experience working in more than one school or district is desirable.
- Nominees should be recognized as being successful educators — those who have effectively contributed to the success of their students and schools.
- Where possible, nominate educators possessing indicators of excellence, such as recognition as Educator of the Year (e.g. Principal of the Year, Teacher of the Year, etc.), National Board for Teaching Standards certification, or active involvement or leadership in a professional association.

Below is a list of suggested qualifications for specific positions:

- Teacher (Including general education teachers, prekindergarten teachers, LEP teachers, special education teachers, Title I teachers, etc.). Teachers are needed for all levels of schooling, e.g. elementary, middle and high school.
    - 5 years minimum of teaching experience, with at least 2 years in Maryland.
    - If the teacher being selected is for a specialized teaching position such as an LEP teacher or special education teacher, at least 1 year in the specialized role in addition to 4 years of general teaching experience.

- Teacher Leader/Coordinator (Including specialized teacher positions such as master teacher, teacher leader, prekindergarten program coordinator, LEP teacher leader/coordinator, special education lead teacher/coordinator, etc.). Teacher leaders/coordinators are needed for all levels of schooling, e.g. elementary, middle and high school.
    - 5 years minimum of teaching experience, with at least 2 years in Maryland.
    - If the teacher being selected is for a specialized position such as LEP or special education teacher leader or coordinator, at least 1 year in the specialized role in addition to 4 years of general teaching experience.

- Instructional Coach
    - 3 years minimum of instructional coaching experience
    - Possess a track record of increasing teacher quality

- Tutor
    - Should be a certificated teacher, not an aide or volunteer
    - 3 years minimum of tutoring experience
    - Possess a track record of increasing student performance

- Principal (Principals are needed for all levels of schooling, e.g. elementary, middle and high school).
    - 7 years of education experience
    - 3 years of experience in school-level administrative leadership roles, including at least one year as principal
    - Highly qualified assistant principals may be substituted if they possess the same level of experience, e.g. 7 years of education experience, 3 years of experience in school-level administrative leadership roles, and at least one year as an assistant principal

Appendix B.4: Professional Judgment and Evidence-Based Professional Judgment Panel Participant Nomination Memo

To: Maryland Education Leaders

From: Maryland State Department of Education on behalf of Augenblick, Palaich and Associates; Picus Odden and Associates; and Maryland Equity Project

Date:

Re: Nominating Educators to Serve on Professional Judgment and Evidence Based Panels

As you may be aware, the Maryland State Department of Education has contracted with Augenblick, Palaich, and Associates (APA), in partnership with Picus Odden and Associates (POA) and the Maryland Equity Project (MEP), to study the adequacy of school funding in the state of Maryland. Two of the approaches the research team will use for estimating adequacy are the professional judgment and evidence based approaches. Both of these approaches involve inviting educators to participate in a series of panels where they will share their expertise and experiences to help the research team understand the resources needed to educate students to Maryland's academic standards.

To ensure the success of the panels, we need your help in identifying experienced educators from schools that have been successful in educating all students or with a track record of individual success in working with students. You will find an attached document describing the preferred guidelines and criteria for nominating educators to participate on these panels. Please provide the name, position, school, district, phone number, and email of the nominee.

Once we have received your nominations, we will contact the nominees directly. Most teachers and principals will be asked to serve on panels for identifying school-based resources. One set of these school panels, which focuses on the evidence based approach, will be managed by POA and will be held this summer during the week of June 22-26. A second set of school panels focused on the professional judgment approach will be managed by APA and be held in the fall of 2015 after the start of the school year. A small number of teachers and principals will be asked to serve on panels that look at resources from a district or state perspective. These panels will be held later in the fall and winter. The exact dates, locations, and other details are still to be determined. Most panels meet for one day, while several panels meet for up to two days. Lunch will be provided whenever a panel meets past noon. We understand the time of educators is valuable, and will do everything in our abilities to minimize conflicts with work duties of the nominees in this process. We do not anticipate any educator being asked to serve on more than one panel. Your district will be reimbursed for the cost of substitute teachers if they are needed to provide release time for participating teachers. A stipend will be paid to teachers serving on panels held in June.

Please feel free to contact the Maryland State Department of Education (should add designated contact here) if you have any questions. Thank you very much for your cooperation in this process! We look forward to working with you.

Appendix B.5: Review of Maryland Requirements for Schools and Districts

The following is a brief review of key requirements for schools and districts in Maryland. All language is derived directly from the following sources: the Maryland State Department of Education and the State Board of Education (through the MSDE website and the Maryland Report Card website); and the 2014 Legislative Handbook Series Volume IX: Education in Maryland.

Compulsory Education and Minimum Days/Hours of Instruction[1]

Maryland law requires all children between the ages of 5 and 16 who live in the state to attend school. Also, every child must attend kindergarten before entering grade one. A child may be excused from going to kindergarten if he or she is in a full-time licensed childcare center, a full-time registered family day-care home, or is in a Head Start five-year-old program part time.

Under the new Age of Compulsory School Attendance law (Senate Bill 362, signed into law in 2012), the age for compulsory school attendance will rise to 17 in the 2015-2016 school year, and to 18 in the 2017-2018 school year.

Public schools must be open at least 180 days over a 10-month period and must provide at least 1,080 hours of instruction for elementary and middle schools and 1,170 hours for high schools.

Maryland College and Career Standards[2]

Schools across the State in 2013-14 have implemented Maryland's College and Career-Ready Standards. These standards incorporate the Common Core State standards. Maryland was one of the first states to adopt the standards in reading/English language arts and mathematics. The Maryland State Board of Education adopted the standards by unanimous vote in June 2010. The Next Generation Science Standards were also adopted in June 2013. These rigorous education standards establish a set of shared goals and expectations for what students should understand and be able to do in grades Kindergarten to grade 12 in order to be prepared for success in college and the workplace.

The Maryland State Department of Education had previously developed, and the State Board of Education had approved, a statewide curriculum or State standards that define what students should know and be able to do in the additional subject areas of fine arts, social studies, health, world languages, Limited English Proficient students, school-library media, financial literacy, environmental education, technology education, and physical education. For some of these curricula the standards, indicators, and objectives are written grade by grade, while others are written in three grade bands consisting of grade three through grade five, grade six through grade eight, and grade nine through grade twelve.

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[1] Legislative Handbook

[2] Maryland State Department of Education website and legislative handbook

Graduation Requirements[3]

As of 2005, to be awarded a diploma, a student shall be enrolled in a Maryland public school system and have earned a minimum of 21 credits that include the following:

Subject Area	Specific Credit Requirements
English	4 credits
Mathematics	3 credits 1 in algebra, 1 in geometry, 1 in another area
Science	3 credits 1 in biology, 2 that must include lab experience in any or all of the following areas: earth science, life science, physical science
Social Studies	3 credits 1 in U.S. History, 1 in World History, 1 in local, state or national government
Fine Arts	1 credit
Physical Education	½ credit
Health	½ credit
Technology Education	1 credit
Other	2 credits in World Language or 2 credits in American Sign Language or 2 credits in Advanced Technology Education and 3 credits in electives or 4 credits in a state-approved career and technology program and 1 credit of elective

[3] MSDE website

Additional Mathematics Course Requirement[4]

In addition to the Maryland College and Career-Ready Standards, the College and Career Readiness and College Completion Act of 2013 established further requirements for mathematics. Beginning with the grade nine class of the 2014-2015 school year, each student is required to enroll in a mathematics course during each year that the student attends high school. It is the law's goal that all students achieve mathematics competency in at least Algebra II by the time they graduate. Regulations published by the State Board of Education identify mathematics courses that will satisfy the four-year requirement to include Algebra II, Pre-calculus, Discrete Mathematics, Linear Algebra, Probability and Statistics, AP Computer Science (or a computer science course that is not AP if the local school system determines that the course meets other specified requirements), and AP Calculus.

Service Learning Requirements[5]

Students must also meet service learning requirements that vary by district. To fit with Maryland's Seven Best Practices for Service Learning, a high quality service learning experience will:

1. Address a recognized need in the community
2. Achieve curricular objectives
3. Reflect throughout the service learning experience
4. Develop student responsibility
5. Establish community partnerships
6. Plan ahead for service learning
7. Equip students with knowledge and skills needed for civic engagement

Assessments[6]

Partnership for Assessment of Readiness for College and Careers (PARCC) Assessments

Students in grades three through eight, and in English 10 and Algebra are to be assessed using the Partnership for Assessment of Readiness for College and Careers (PARCC) assessments. The new PARCC assessments are aligned to the Maryland College and Career-Ready Standards which were developed from the Common Core and were fully implemented during the 2013-14 school year. PARCC will provide comparability across states and be able to assess and measure higher order skills such as critical thinking, communications, and problem solving. The assessments are computer-based and include a mix of constructed response items, performance-based tasks, and computer-enhanced items. Paper and pencil PARCC state assessments will be available for at least three years during the transition to online testing, and will be available for special needs beyond the transition.

[4] Legislative Handbook
[5] MSDE website
[6] MSDE website

Science and Social Studies Assessments

The science Maryland School Assessment will continue to be given in grades five and eight until the Next Generation Science Assessment is developed. The Government High School Assessment will continue to be required for graduation, and the Biology High School Assessment will be replaced with the Next Generation Science Assessment when it is completed.

Alternate Maryland School Assessment*/National Center and State Collaborative Assessment*

The Alternate Maryland School Assessment (Alt-MSA) and the National Center and State Collaborative (NCSC) Assessment are assessments in which students with the most significant cognitive disabilities participate if the IEP process has been determined they cannot participate in the MSA/PARCC assessments even with accommodations.

In compliance with state and federal law, MSDE has used the Alt-MSA to assess reading and math in grades three through eight and 10, and science in grades five, eight, and 10. Beginning with the 2015-2016 school year, the NCSC assessment will replace the Alt-MSA for reading and math.

The NCSC alternative assessment does not currently include a science component, so Maryland will continue to use the Alt-MSA for science only.

ACCESS for LEPs

The English Language Proficiency Assessment, ACCESS for LEPs, is administered to Limited English Proficient (LEPs) in grades Kindergarten through 12 annually. The assessment measures a student's English language proficiency in the areas of listening, speaking, reading, writing, comprehension, oral, and literacy. English Language Proficiency Assessment results are used by the State and the local education systems to report information related to the English language proficiency targets, referred to in the NCLB, Title III as Annual Measurable Achievement Objective (AMAO). AMAO I measures LEP students' progress in learning English; AMAO II measures the number of students who attain English proficiency during the school year.

Accountability[7]

Waivers from the Federal Elementary and Secondary Education Act[8]

The federal No Child Left Behind Act, the most recent reauthorization of the Elementary and Secondary Education Act of 1965, requires every state to meet certain annual benchmarks. A school that fails to meet the requirements of No Child Left Behind may be subject to strict penalties for noncompliance. Due to the strict penalties of No Child Left Behind, the U.S. Department of Education offered states an opportunity to apply for waivers from certain provisions of No Child Left Behind (flexibility waivers). In order to receive a flexibility waiver, states must outline their plans to improve educational outcomes for all students, close achievement gaps, increase equity, and

[7] Maryland Report Card website
[8] Legislative Handbook

improve the quality of instruction. A flexibility waiver applies to 10 No Child Left Behind requirements and up to three optional requirements that a state chooses.

Maryland received a flexibility waiver which allowed the State and its local education agencies to focus on implementing the Maryland College and Career-Ready Standards; transition to the Partnership for Assessment of Readiness for College and Careers assessments; provide support, recognition, and intervention to all Maryland public schools; and develop a teacher and principal evaluation system that incorporates student growth, measured by assessments, as a major component.

Maryland's Accountability Program

Maryland's new Accountability Program is comprised of three components, (1) School Progress, (2) School Progress Index (SPI), and (3) Differentiated Recognition.

The new Maryland School Progress Index is based on high expectations and multiple measures that include student achievement data in English/Language Arts, Mathematics, and Science; growth data in English/Language Arts and Mathematics; gaps, based on the gap score between highest-achieving and lowest-achieving subgroups in mathematics, reading, science, cohort graduation and cohort dropout rates. Maryland's Progress Index will differentiate schools into one of five strands which determine the district and state support schools receive. The State affords top performing schools greater flexibility while lower-performing schools receive progressively more prescriptive technical assistance, expectations, and monitoring.

The School Progress Index evaluates schools on a continuous scale based on the variables of Achievement, Growth, Gap Reduction, and College and Career Readiness. The indicators are specific to Elementary and Middle schools or High Schools. Each indicator is comprised of specific measures for Elementary and Middle schools or High Schools. SPI is compensatory so that a low value on one indicator can be balanced by a high value on another indicator. Each of the indicators comprising the Index are differentially weighted based on their importance in assessing overall school progress.

The Annual Measurable Objectives (AMOs) for each component of the Index are based on a trajectory toward the goal, the time by which each individual school is expected to reduce its percent of students that are not proficient by half for Achievement, reduce its students not showing Growth by half, reduce the gap between the lowest and highest performing subgroups by half, and reduce the number of students that are not completing the goals for College and Career-Readiness by half.

The School Progress Index results in a Strand classification of 1 (highest) to 5 (lowest) which in turn helps identify schools for intervention, supports, and recognition of schools achieving at high levels or making exceptional progress.

Requirements for Publically-funded Prekindergarten Programs[9]

The overall goal of the prekindergarten program is to provide learning experiences to help children develop and maintain school readiness skills necessary for successful school performance.

Local boards of education shall provide prekindergarten programs to accommodate all eligible four-year-old children seeking enrollment in public school programs. Eligible children include all four-year-old applicants who are from families with economically disadvantaged[10] backgrounds or who are homeless; if vacancies remain after compliance with this regulation, a local school system may enroll four-year-old applicants who are not from families with economically disadvantaged backgrounds but who represent a student population that exhibits a lack of school readiness. A program for three-year-old children may also be established for children that fit these same criteria. A qualified vendor will: (1) Maintain state or national early childhood program accreditation; (2) Have the capacity to meet the responsibilities identified in this regulation; (3) Be licensed to operate a childcare center: and (4) Provide responses to Department requests for information and data related to the operation of the prekindergarten program.

Further, a local school system shall: (1) Develop and maintain a policy for determining the eligibility and selection of prekindergarten sites as well as the eligibility of four-year-old students for prekindergarten programs consistent with the requirements of this chapter; (2) Develop criteria that establishes procedures to include children in the prekindergarten program who are not economically disadvantaged; (3) Operate the prekindergarten educational program 5 days per week for a minimum of 2.5-hours per day consistent with the school calendar approved by the local board; (4) Analyze the Department-approved kindergarten assessment system information to evaluate the effectiveness of the prekindergarten program, and make necessary adjustments to the prekindergarten instructional program; (5) Provide data in the Bridge to Excellence Master Plan needs assessment to indicate progress on prekindergarten program goals; (6) Provide staffing for each session of prekindergarten to include a teacher who possesses a current state professional certificate in early childhood education and a para-professional with a minimum of a high school diploma, or its equivalent, or a CDA; (7) Align each prekindergarten program with the Maryland Common Core State Curriculum; (8) Based on the September 30 enrollment count, maintain an average staff to student ratio of 1:10 with an average of 20 students per classroom; and (9) Provide responses to Department requests for information and data related to the operation of the prekindergarten program.

Education of Students with Disabilities[11]

Federal law requires states to provide a free appropriate public education to all students with disabilities through age 21 who are found to be in need of special education services. In order to

[9] State Board of Education via MSDE website
[10] Economically disadvantaged being 185 percent of poverty
[11] Legislative Handbook

meet the requirement, the education programs for disabled students must be designed to meet their individual needs and could include specially designed instruction in classrooms, at home, or in private or public settings. Examples of these services include speech, occupational, and physical therapy, psychological counseling, and medical diagnostic services that are necessary to a child's education. Teachers of students with disabilities are required to be trained in the instruction of disabled students. Services begin as soon as the child can benefit from them, regardless of whether the child is of school age.

Maryland High School Certificate[12]

This certificate is awarded to students with disabilities who do not meet the requirements for a diploma but who meet one of the following criteria:

1. The student is enrolled in a special education program for at least four years beyond Grade eight, or its age equivalent. The student is determined to have developed appropriate skills for the individual to enter the world of work, act responsibly as a citizen, and enjoy a fulfilling life by an Individualized Educational Program (IEP) Team, with agreement of the student's parents/guardians. The world of work includes, but is not limited to, gainful employment, work activity centers, supported employment, or sheltered workshops.
2. After being enrolled in a special education program for four years beyond Grade eight, or its age equivalent, the student reached age 21.

Teacher Certification[13]

The Maryland State Department of Education oversees the certification of teachers, principals, and other school personnel and evaluates and approves higher education programs that educate and prepare teachers and other certified school personnel, in collaboration with the Professional Standards and Teacher Education Board. In order to ensure teacher quality and that students are being taught by qualified, competent teachers, the Maryland State Department of Education is also responsible for state approval and national accreditation for all professional educator certification programs in Maryland's colleges and universities.

The federal No Child Left Behind Act requires that all teachers of core academic subjects be highly qualified. Core academic subjects include English, mathematics, reading or language arts, science, foreign languages, civics and government, economics, arts, history, and geography. To be highly qualified, a teacher must have at least a bachelor's degree, hold a license to teach in the State, have obtained full state certification, and have subject matter expertise. Schools are required by federal law to annually report on the number of teachers who are not highly qualified.

[12] MSDE website
[13] Legislative Handbook

Teacher and Principal Evaluations[14]

Chapter 189 of 2010, the Education Reform Act, enhanced accountability measures for teachers and principals by requiring annual performance evaluations for non-tenured certificated teachers and principals that include student growth as a significant component. The law also added a third probationary year before teachers may receive tenure.

MSDE developed a statewide Teacher and Principal Evaluation (TPE) system. The state TPE system includes equally weighted measures of professional practices and student growth. Each district is responsible for evaluating its certified teachers and principals, using either the state system or a locally developed system that has been endorsed by both the State and local education agencies' collective bargaining units.

The State Board of Education regulations require that a District's teacher and principal evaluation system meet the minimum general standards set forth in the regulations. The general standards require at least two classroom observations (for teachers), claims and evidence that substantiate observed behavior, a professional development component, a mentoring component for ineffective-rated teachers and non-tenured teachers, and a measure of student growth that is a significant factor in the overall rating and is based on multiple measures. An evaluation must have a written report that is presented to the evaluated teacher or principal, a space for written comments by the evaluated teacher or principal, and a process for appealing a final rating and report.

The student growth component should count for 50 percent of an evaluation, may not be based solely on an existing or newly created exam, and must be based on multiple measures, such as aggregate class growth scores and student learning objectives and the schoolwide performance index. However, student growth data based on or derived from state assessments may not be used to make personnel decisions until school year 2016-17.

The professional practice component should also count for 50 percent of an evaluation. For teachers, this component includes planning and preparation, classroom environment, instruction, and professional responsibility. For principals, the professional practice component should include the outcomes in the Maryland Instructional Leadership Framework, which is comprised of eight domains: (1) school vision; (2) school culture; (3) curriculum, instruction, and assessment; (4) observation/evaluation of teachers; (5) integration of appropriate assessments; (6) use of technology and data; (7) professional development; and (8) stakeholder engagement. The professional practice component also should include outcomes developed by the Interstate School Leaders and Licensure Consortium, including (1) school operations and budget; (2) effective communication; (3) influence on the school community; and (4) integrity, fairness, and ethics.

[14] Legislative Handbook and MSDE

Appendix B.6: Instructions to Maryland Professional Judgment Panel Members

Augenblick, Palaich and Associates

Denver, Colorado

[Panel Date]

The work you are doing today is part of an adequacy study being conducted in Maryland on behalf of the Maryland State Department of Education. It relies on your professional experience to identify the resources needed so that all students, schools, and districts can fulfill all state standards. Below you will find a number of instructions to help you in this process. It is important to remember that you are not being tasked to build your "Dream School." Instead, you are being asked to identify the resources needed to meet the specific standards and requirements that the State expects students, schools and districts to fulfill. You should allocate resources as efficiently as possible without sacrificing quality. You are a member of a panel that is being asked to design how programs and services will be delivered in representative school settings. These panels are being used to identify the resources that schools with a particular set of demographic characteristics should have in order to meet a specific set of "input" requirements and "output" objectives.

1. **[Description of prior panels held, example language here from final statewide panel]** Previously, four school-level professional judgment panels were convened to address: (1) elementary schools; (2) prekindergarten programs; (3) middle schools; and (4) high schools. Each panel discussed more than one representative school for that grade configuration of varying size, and addressed resources needed to serve all students ("base" resources) and at risk students. Two additional panels were then held to review the work of the school-level panels and address the resources needed for (1) special education students, and (2) English Language Proficient (LEP). A district-level panel was also held to review the work of all prior panels, and identify the district-level resources needed to support schools. Finally, a CFO panel was held earlier this week to specifically review non-personnel costs at the school and district level.

2. **[Short description of current panel, example language here from final statewide panel]** Today, you are serving on a statewide review panel to review the work of all prior panels and address any inconsistencies or outstanding issues.

3. The characteristics of each representative school(s) are identified, including: (1) grade span; (2) enrollment; and (3) the proportion of at risk students (based on those students eligible for free/reduced price lunch), LEP students, and special education students.

4. The "input" requirements and "outcome" objectives that need to be accomplished by the representative school(s) are those required by the State. These requirements or objectives can be described broadly as education opportunities, programs, services, or as levels of education performance. You will be provided a short summary of state expectations and performance standards; it is not meant to be exhaustive of all requirements that the State requires schools and districts to fulfill but instead should be considered a refresher or reminder.

5. In designing the representative school(s), we need you to provide some very specific information so that we can calculate the cost of the resources that are needed to fulfill the indicated requirements or objectives. The fact that we need that information should not constrain you in any way in designing the program of the representative school(s). Your job is to create a set of programs, curriculums, or services designed to serve students with particular needs in such a way that the indicated requirements/objectives can be fulfilled. Use your experience and expertise to organize personnel, supplies and materials, and technology in an efficient way you feel confident will produce the desired outcomes.

6. For this process, the following statements are true about the representative school(s) and the conditions in which they exist:

Teachers: You should assume that you can attract and retain qualified personnel and that you can employ people on a part-time basis if needed (based on tenths of a full-time equivalent person).

Facilities: You should assume that the representative school has sufficient space and the technology infrastructure to meet the requirements of the program you design.

Revenues: You should not be concerned about where revenues will come from to pay for the program you design. Do not worry about federal or state requirements that may be associated with certain types of funding. You should not think about whatever revenues might be available in the school or district in which you now work or about any of the revenue constraints that might exist on those revenues.

Programs: You may create new programs or services that do not presently exist that you believe address the challenges that arise in schools. You should assume that such programs or services are in place and that no additional time is

needed for them to produce the results you expect of them. For example, if you create after-school programs or prekindergarten programs to serve some students, you should assume that such programs will achieve their intended results, possibly reducing the need for other programs or services that might have otherwise been needed.

Appendix B.7: Evidence-Based Professional Judgment Panel's Introduction to Evidence-Based Method

Using the Evidence-Based Method to identify a Base Spending level and Pupil Weights for the Maryland School Funding System

Professional Judgment Panel Meetings

Picus Odden & Associates

Improving the way public resources for education are translated into improved student learning

Today's Agenda

- Introductions
- The Evidence-Based (EB) Funding Model
- The Improvement Model in the EB Model
- Purpose of Professional Judgment Panels
- Discussion of EB Model Elements

Introductions

Team Members

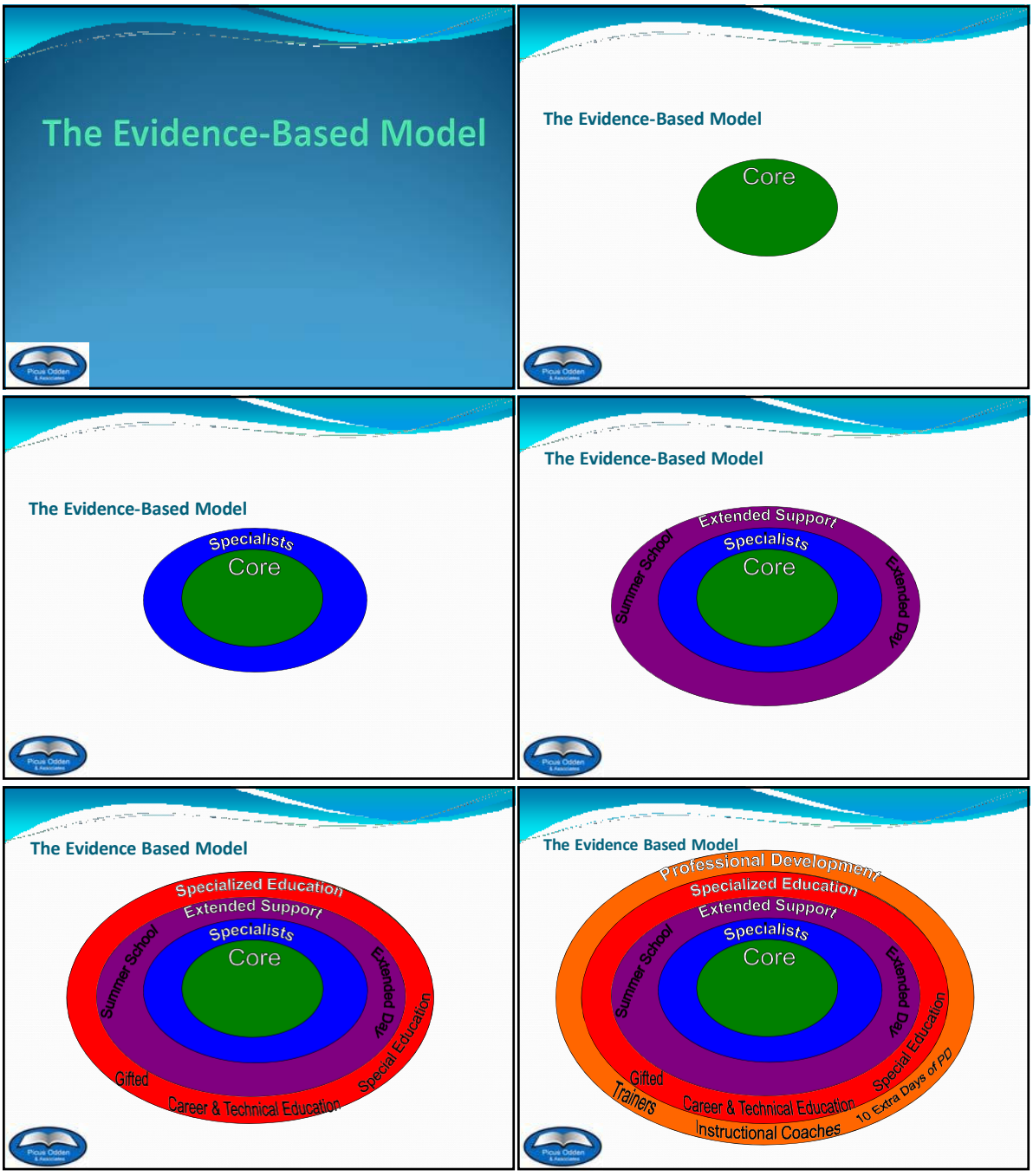
- Picus Odden and Associates
  - Lawrence O. Picus
  - Allan Odden
- Maryland Equity Project
  - Amaya Garcia
  - Rebecca Grove
  - Kathleen Hoyer

Mission Statement

Picus Odden and Associates is an independent school finance consulting group whose mission is to work collaboratively with states and school districts to improve the way public resources for education are translated into improved student learning.

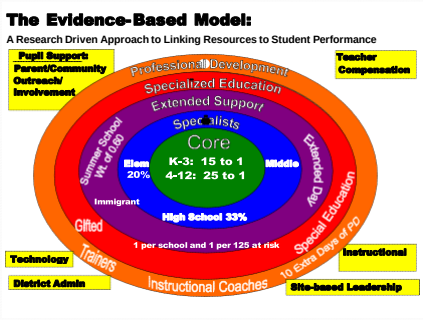
Overview of the Maryland School Funding Study

- Study Partnership with APA Consulting
- Three approaches to estimating adequacy
  - Professional Judgment
  - Successful Schools/Districts
  - Evidence-Based (Picus Odden & Assoc.)
    - Evidence-Based report
    - Professional Judgment panel
    - Case studies


The Evidence-Based Model
The Evidence-Based Model
Core
The Evidence-Based Model
Specialists
Core
The Evidence-Based Model
Extended Support
Specialists
Core
Summer School
Extended Day
The Evidence Based Model
Specialized Education
Extended Support
Specialists
Core
Summer School
Extended Day
Special Education
Gifted
Career & Technical Education
The Evidence Based Model
Professional Development
Specialized Education
Extended Support
Specialists
Core
Summer School
Extended Day
Special Education
Gifted
Trainers
Career & Technical Education
10 Extra Days of PD
Instructional Coaches

The Evidence-Based Model:

A Research Driven Approach to Linking Resources to Student Performance



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The EB Improvement Model

Strategies to Boost Performance

1. Conduct needs assessment
2. Set high goals
3. Adopt a new curriculum and identify effective instructional practices
4. Commit to data-based decision making
5. Invest in on-going professional development, with instructional coaches

Strategies to Boost Performance

6. Focus class time more efficiently
7. Provide multiple and timely interventions for students at risk of academic failure
8. Create professional learning communities
9. Empower leaders to support instructional improvement
10. Take advantage of external expertise
11. Manage Talent

The Challenge

Scale up these strategies in all schools by effectively and efficiently using resources provided by an adequately-oriented state funding model

Note: the EB funding model provides all the resources

Elements of the EB Model

Staff Resources for Core Programs

Heuristic Use of Prototypical School Sizes

- 450 elementary school, 75 students per grade
- 450 middle school, 150 students per grade
- 600 high school, 150 students per grade
- All can be scaled up or down

1a. Pre-Kindergarten

- Full day prekindergarten program
- Staff at 1 teacher and 1 aide position for every 15 PreK students

1b. Kindergarten

- Full day kindergarten program
- Each kindergarten student counts as 1.0 pupil in the funding system.

2. Core Teachers (Elementary)

- Student/Teacher Ratio
  - 15:1 – Grades K-3
  - 25:1 – Grades 4-5

3. Core Teachers (Secondary)

- Student/Teacher Ratio
  - 25:1 – Grades 6-12

4. Elective Teachers

- Elementary – 20% of Core Teachers
- Middle – 20% of Core Teachers
- High School – 33% of Core Teachers

5. Instructional Coaches

- 1.0 FTE Instructional Coach position for every 200 students

6. Core Tutors

- One tutor position for each prototypical school

- Note: Additional tutors are provided through the at risk pupil count in element 22

7. Substitute Teachers

- 5 % of core and elective teachers, instructional coaches, tutors (and teacher positions in additional tutoring, extended day, summer school and LEP)

8. Core Guidance Counselors and Nurses

- 1 guidance counselor for every 450 K-5 students
- 1 guidance counselor for every 250 6-12 students
- 1 nurse for every 750 K-12 students

9. Supervisory Aides

- 2 for each prototypical 450-student elementary and middle school
- 3 for each prototypical 600-student high school

10. Librarians

- 1.0 librarian position for each prototypical school

11. Principal/Assistant Principal

- 1.0 principal for the 450-student prototypical elementary school
- 1.0 principal for the 450-student prototypical middle school
- 1.0 principal and 1.0 assistant principal for the 600-student prototypical high school

12. School Site Secretarial Staff

- 2.0 secretary positions for the 450-student prototypical elementary school
- 2.0 secretary positions for the 450-student prototypical middle school
- 3.0 secretary positions for the 600-student prototypical high school

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Elements of the EB Model

Dollar Per Student Resources

13. Gifted and Talented

- $30 per ADM, inflated annually

14. Professional Development

- 10 days of student-free time for training built into teacher contract year
- $125 per ADM for trainers inflated annually

This is in addition to instructional coaches

15. Instructional Materials

- $190 per pupil for instructional and library materials

16. Short Cycle/Interim Assessments

- $30 per pupil for short cycle, interim and formative assessments

17. Computer Technology and Equipment

- $250 per pupil for school computer and technology equipment

18. Career and Technical Education Equipment

- $10,000 per CTE teacher for specialized equipment

19. Extra Duty Funds and Student Activities

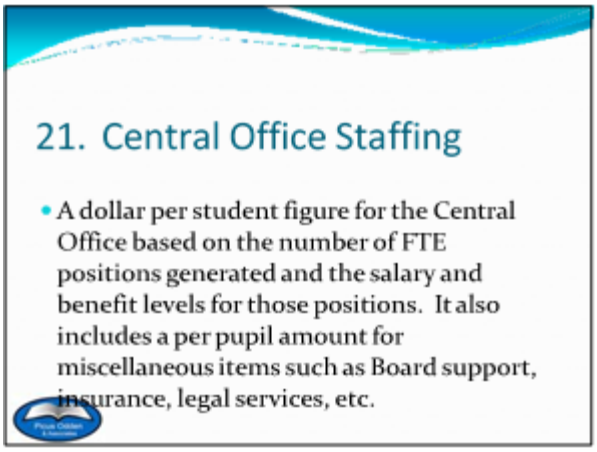
- $250 per student for co-curricular activities including sports and clubs

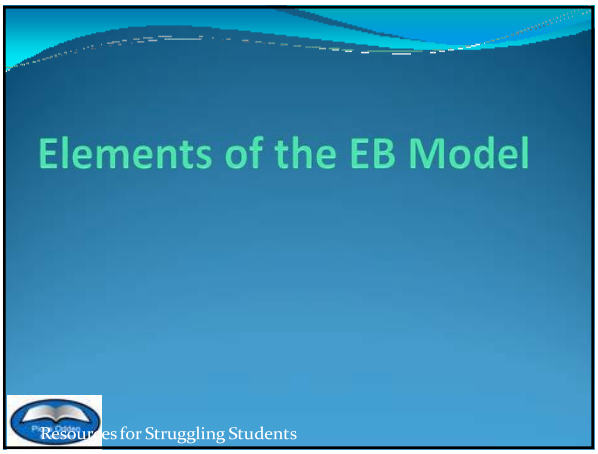
Elements of the EB Model

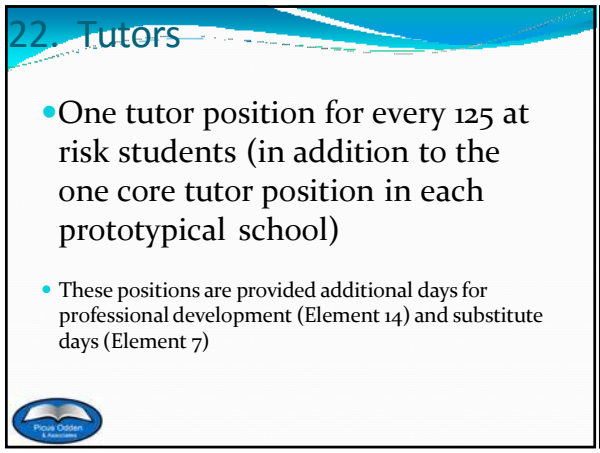
Central Office Staffing

20. Maintenance and Operations

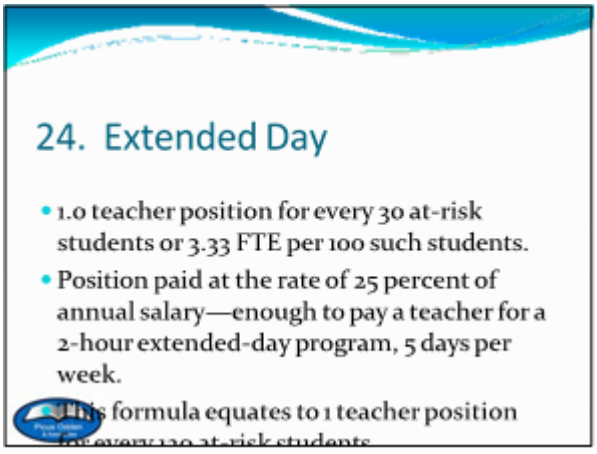
- Separate computations for custodians, maintenance workers and groundskeepers

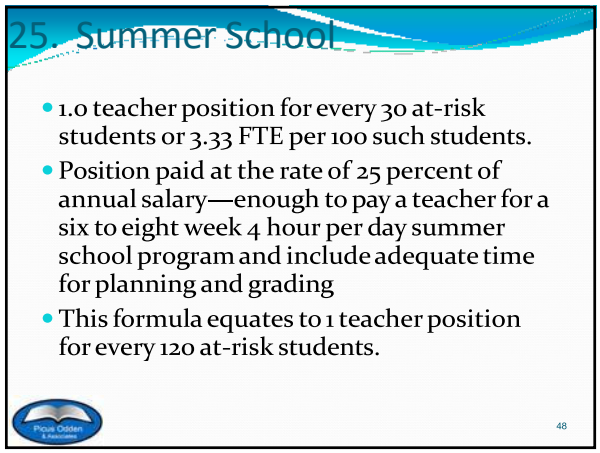

21. Central Office Staffing
• A dollar per student figure for the Central Office based on the number of FTE positions generated and the salary and benefit levels for those positions. It also includes a per pupil amount for miscellaneous items such as Board support, insurance, legal services, etc.


Elements of the EB Model
Resources for Struggling Students


22. Tutors
• One tutor position for every 125 at risk students (in addition to the one core tutor position in each prototypical school)
• These positions are provided additional days for professional development (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 professional development (Element 14)


24. Extended Day
• 1.0 teacher position for every 30 at-risk students or 3.33 FTE per 100 such students.
• Position paid at the rate of 25 percent of annual salary—enough to pay a teacher for a 2-hour extended-day program, 5 days per week.
• This formula equates to 1 teacher position


25. Summer School
• 1.0 teacher position for every 30 at-risk students or 3.33 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 4 hour per day summer school program and include adequate time for planning and grading
• This formula equates to 1 teacher position for every 120 at-risk students.
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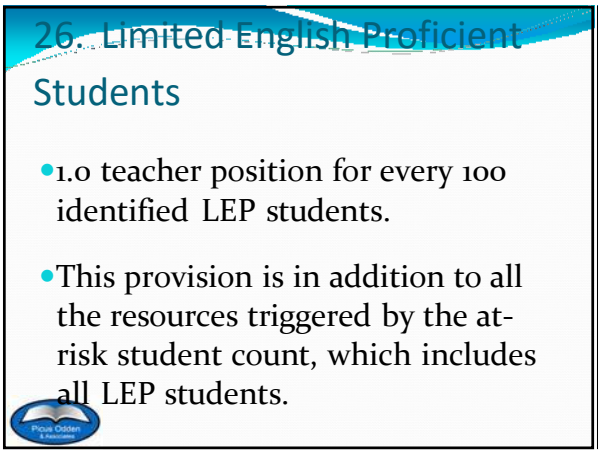
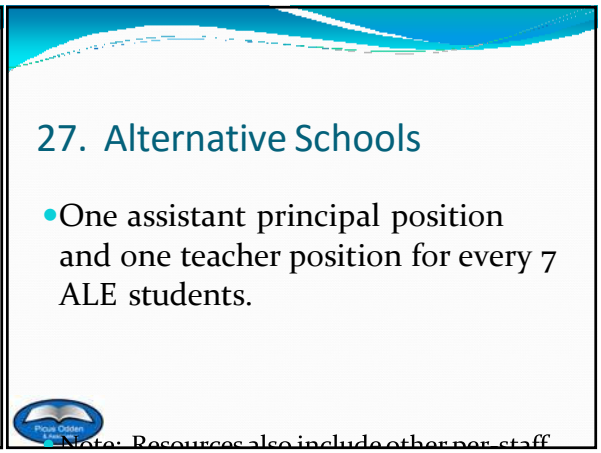
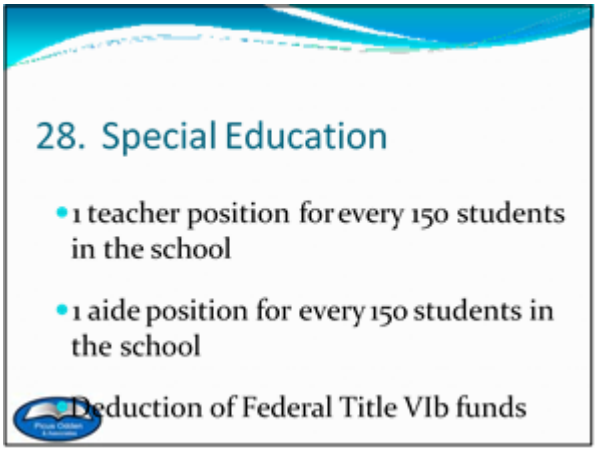
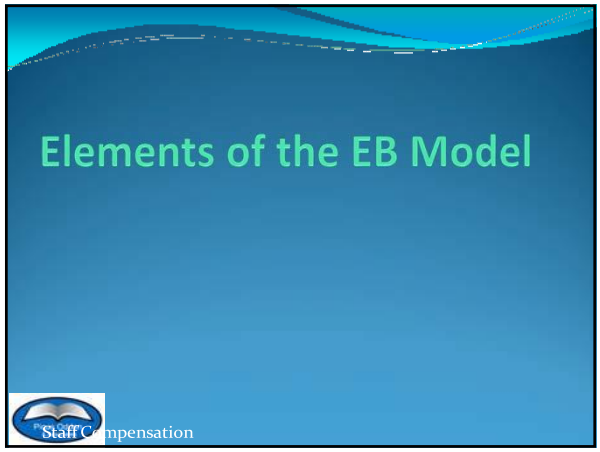
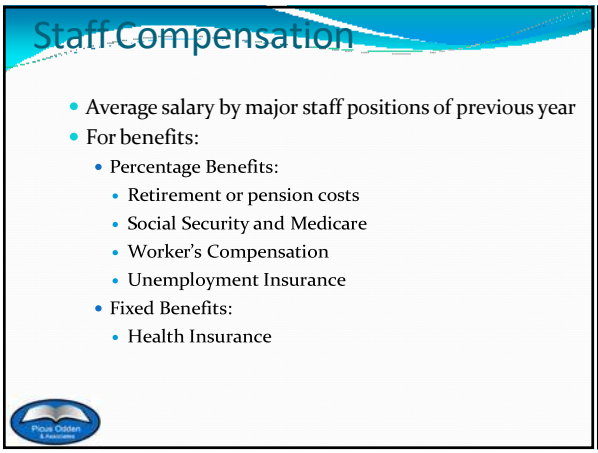

26. Limited English Proficient Students
1.0 teacher position for every 100 identified LEP students.
This provision is in addition to all the resources triggered by the at-risk student count, which includes all LEP students.

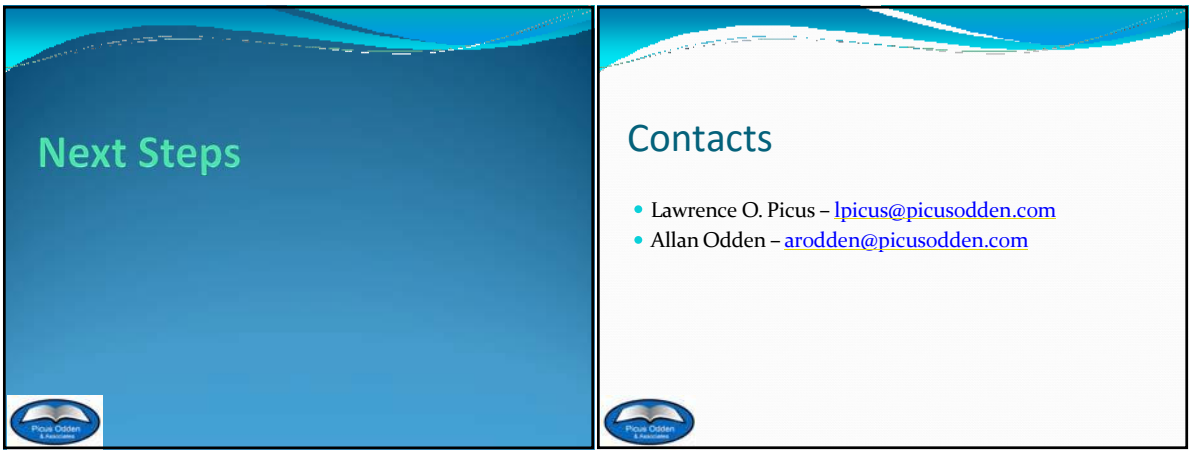

27. Alternative Schools
One assistant principal position and one teacher position for every 7 ALE students.
Note: Resources also include other per-staff


28. Special Education
1 teacher position for every 150 students in the school
1 aide position for every 150 students in the school
Deduction of Federal Title VIb funds


Elements of the EB Model
Staff Compensation


Staff Compensation
Average salary by major staff positions of previous year
For benefits:
Percentage Benefits:
Retirement or pension costs
Social Security and Medicare
Worker's Compensation
Unemployment Insurance
Fixed Benefits:
Health Insurance


Questions & Answers


Next Steps
Contacts
Lawrence O. Picus – lpicus@picusodden.com
Allan Odden – arodden@picusodden.com

Appendix B.8: Ingredient Prices for Professional Judgment and Evidence-Based Models

Table B.5

2014-15 Average Salary by Position (Evidence Based)

Position	Average Salary
School	
Principal	$118,906
Assistant Principal	$100,948
Teacher	$65,440
Instructional Coach	$81,131
Substitute Teacher	$65,440
Guidance Counselor	$72,415
Nurse	$56,842
Instructional/Supervisory Aide	$29,435
Library-Media Specialist	$72,904
School Secretary/Clerical	$43,943
Maintenance and Operations	
Custodian	$42,607
Maintenance Worker	$56,303
Grounds Maintenance	$42,607
Central Office	
Superintendent	$199,670
Business Manager	$125,820
Director Personnel/HR	$125,820
Asst. Supt. of Instruction	$156,314
Director of Pupil Services	$125,820
Director of Assessment	$125,820
Director of Technology	$125,820
Director of O&M	$125,820
Secretary/Clerical	$43,943
Network/Systems Supervisor	$75,000
School Computer Technician	$45,000
Speech Pathologist	$74,608
Psychologist	$86,404

Table B.6
2014-15 Average Salary by Position (Professional Judgment)

School Level	
Position Title	**Salary**
Instructional Staff	
Teachers	$65,440
Instructional Facilitator (Coach)	$65,440
Teacher Tutor/ Interventionist	$65,440
Librarians/Media Specialists	$72,904
Media Aide	$32,677
Technology Specialists	$72,904
Instructional Aides	$29,435
LEP Staff	
LEP Coordinator	$65,440
Special Education Staff	
Speech Pathologist	$74,608
OT/PT Therapists	$79,367
IEP Coordinator	$65,440
Pupil Support Staff	
Counselors	$72,415
Nurses	$56,842
Health Aide	$27,783
Psychologists	$86,404
Social Worker	$80,815
Student/Pupil Support Worker	$95,564
Behavior Specialists	$75,836
Family Liaison	$43,943
Alternative/In School Suspension (Para)	$29,435
Transition Coordinator	$65,440
Job Coaches (Para)	$29,435
Administrative Staff	
Principal	$118,906
Assistant Principal	$100,948
Dean	$87,644
Athletic/Activities Director	$87,644
Bookkeeper	$43,943
Clerical/Data Entry	$43,943
Other Staff	
IT Technician	$53,667
Substitute	$65,440
Coordinator	$65,440

District Level	
Position Title	**Salary**
Superintendent	$199,670
Assistant/Associate Superintendent	$156,314
Executive Director	$125,820
Director	$125,820
Supervisor	$105,039
Coordinator	$105,371
Manager	$105,371
Secretary/Clerk	$43,943
IT Technician	$53,667
Nurse	$56,842
Specialist	$75,836
Other Professional	$75,836
Attorney (Systems and Board)	$125,820
Database Admin/Programmer	$53,667
Therapist/Specialist	$70,551
Interpreter/Translator	$43,943

Table B.7
2014-15 Employee Benefit Costs (Evidence-Based and Professional Judgment)

Employee Benefit	Rate
Social Security	6.20% (Up to $118,500 of salary)
Medicare Insurance	1.45%
State Retirement (Certified)	4.560%
State Retirement (Classified)	8.170%
Workers Compensation (Certified)	0.550%
Workers Compensation (Classified)	2.18%
Unemployment Insurance	2.8%
Medical Insurance	$8,537

Table B.8

2014-15 Technology Prices (Professional Judgment)

	Cost per Unit	Replacement Cycle	Annual Price
Administration/Main Office			
Computers	$826	4	$207
Laptops	$1,124	4	$281
Mobile Device	$528	4	$132
Printers	$299	4	$75
Copier	$625	4	$156
Faculty			
Computers	$831	4	$208
Laptops	$1,124	4	$281
Mobile Device	$528	4	$132
Classroom			
Computers	$826	4	$207
Printers	$299	4	$75
Visual Presentation System	$1,948	4	$487
Document Camera	$450	4	$113
Wireless Access Point	$560	4	$140
Computer Lab(s)-Fixed			
Computers	$826	4	$207
Printers	$299	4	$75
Visual-Presentation System	$1,948	4	$487
Computer Lab(s)-Mobile			
Laptops	$840	4	$210
Media Center			
Computers	$820	4	$205
Printers	$299	4	$75
Other			
Student Devices	$429	4	$107
Headphones	$19	4	$5
Protective Cases	$25	4	$6
LCD TV (Digital Signage)	$843	4	$211

Appendix C

Successful Schools Materials

Appendix C.1: Study of Adequacy of Funding for Education in Maryland Instructions for School Expenditure Data Collection Tool

OVERVIEW:

We are asking you to complete the accompanying Data Collection Tool(s) as part of the adequacy study APA Consulting is conducting for the Maryland State Department of Education. This study was required by the Bridge to Excellence in Public Schools Act, which enacted the recommendations of the Thornton Commission, to make recommendations for updating the state's school finance formula. The results of this and two other approaches to estimating the cost of an adequate education will be used to recommend a new base per pupil funding amount and weights for students with special needs in fall 2016.

The purpose of this survey is to collect the amount of money the selected school spends to provide its basic education program, that is, the general education program provided for all students enrolled in the school. This amount should exclude spending for supplemental programs and services for students who are at risk, Limited English Proficient students, or have an Individualized Education Program (IEP) through the special education program. This spending information will be used to help estimate a new per-pupil basic foundation amount.

Please complete a Data Collection Tool workbook for each school from your district selected for the successful schools study. Please note that if you are completing more than one Data Collection Tool (e.g. two or more schools from your district were selected for the study), you are only required to complete the district-level sections in the General Information and District Administration tabs once. If you do not see a cell for entering a school expenditure related to the school's general education program, please describe the expenditure and enter the amount in either the Notes or Questions box found at the bottom of each program area tab or the Comments tab.

The following applies to all data you will enter in the Data Collection Tool:

- *All data should be for the 2014-15 school year*
- *All student and staff information should be as of September 30, 2014*
- *Please report actual expenditures for 2014-15, not budgeted*
- *Do not include any expenditures for Category 206 – special education*
- *Please list the source for all information provided (E.g. budget, district/state data reporting system, required state or federal reports, etc.)*

Please read the instructions carefully as you complete the Data Collection Tool. If you have any questions please contact:

Mark Fermanich
APA Consulting
mlf@apaconsulting.net
720-227-0101

Thank you for your help!

GENERAL INFORMATION (INFO) TAB:

We will begin by asking for information about the selected school (the name of the school is part of the Microsoft Excel workbook file name).

All Student Counts should be taken from your September 30th, 2014 enrollment count. Staff information should also be based on staff working in the school and district as of September 30th, 2014.

- In cell C5, please use the drop-down menu to enter the lowest grade served by the school (for example, PK).
- In cell E5, please use the drop-down menu to enter the highest grade served by the school (for example, grade six).

  If the drop-down menus are not compatible with your version of Microsoft Excel, please simply enter the lowest grade served in cell C5 and the highest grade served in cell E5.

- In cell B8, please enter the total number of FTE students enrolled in grades one through 12. We understand that most schools will not have this full grade span. We are requesting the count only of those students not in kindergarten or prekindergarten served by the school.
- In cell B9, please enter the total number of enrolled FTE full-day kindergarten students if any.
- In cell B10, please enter the total number of enrolled FTE half-day prekindergarten students if any.
- In cell B11, please enter the total number of enrolled FTE full-day prekindergarten students if any.

For the questions requesting information about teachers (cells B15, B17, B33, and B35), please include classroom, specialist (music, art, physical education, foreign language, etc.), Title I, special education, English language learner, long-term substitutes, and other certified staff with direct instructional responsibilities. Do not include other professional student support staff without instructional responsibilities such as media/librarians, guidance counselors, social workers, nurses, therapists, psychologists, etc.

- In cell B15, please enter the average years of experience of all teachers working in the identified school. When calculating the school's average years of experience, please enter the teachers' total teaching experience, not their years of experience working in this school or district.
- In cell B17, please enter the percent of teachers in the identified school who hold an APC or National Board of Professional Teaching Standards certification.

In the next section we request information about your entire district. ***If more than one school has been identified in your district and you have already provided this information you may skip this section*.**

- In cell B22, please enter the total number of enrolled FTE half-day prekindergarten students if any.
- In cell B23, please enter the total number of enrolled FTE full-day prekindergarten students if any.
- In cell B24, please enter the total number of enrolled FTE full-day kindergarten students if any.
- In cell B25, please enter the total number of enrolled FTE elementary students in the district.
- In cell B26, please enter the total number of enrolled FTE middle school or junior high students in the district.
- In cell B27, please enter the total number of enrolled FTE high school students in the district.
- In cell B29, please enter the district's total operating expenditures for 2014-2015, this would include both restricted and unrestricted funds.

  This amount should consist of actual 2014-15 expenditures reported in the Current Expense fund *excluding* any expenditures for transportation, food service, adult education, district payments for retiree benefits, and non-Current Expense Fund capital expenditures. (The amount should include capital expenditures from the Current Expense Fund).

- In cell B33, please enter the average years of experience for all teachers in the district.

  Please follow the instructions for calculating the average years of experience for all teachers in the school listed above.

- In cell B35, please enter the percent of teachers in the district who hold an APC or National Board of Professional Teaching Standards certification.

DISTRICT ADMINISTRATION TAB:

If more than one school has been identified in your district and you have already provided this information you may skip this section.

All FTE and Personnel Costs data should be for staff working in the district as of September 30, 2014.

The first section addresses expenditures for General Support Services, identified in the Maryland *Financial Reporting Manual* with category code 20121. Please enter the full district cost for each area.

- In cell B9, please enter the total amount expended for salaries and wages for General Support Services.
- In cell C9, please enter the amount of employee fringe benefits reported in Fixed Charges (Category 212) that correspond to the salaries identified in cell B9, the salaries and wages for General Support Services. Fringe benefits should include the employer's share of FICA; Medicare; premiums for health insurance, life insurance, short- and/or long-term disability insurance, and workers' compensation insurance; and any other employee-related Fixed Charges. When reporting the employer's share of retirement contributions, please use 100 percent of the normal cost contributions for fiscal year 2017, assuming the teacher pension cost sharing as specified in the Budget Reconciliation Act of 2012 is fully phased in. The total for fringe benefits may be shown as an amount or as a percentage of total Salaries and Wages. Do not include any payments for retiree benefits.
- Cell D9 shows the total amount expended for salaries and wages and fringe benefits for General Support Services. Please enter this amount if the total does not calculate automatically.

The next section addresses expenditures for Business Support Services, identified in the Maryland *Financial*

Reporting Manual with category code 20122.

- In cell B15, please enter the total amount expended for salaries and wages for Business Support Services.
- In cell C15, please enter the amount of employee fringe benefits reported in Fixed Charges (Category 212) that correspond to the salaries identified in cell B15, the salaries and wages for Business Support Services. Please see the instructions provided above for cell C9 for directions on how to calculate total fringe benefits.
- Cell D15 shows the total amount expended for salaries and wages and fringe benefits for Business Support Services. Please enter this amount if the total does not calculate automatically.

The next section addresses expenditures for Centralized Support Services, identified in the Maryland *Financial Reporting Manual* with category code 20123.

- In cell B21, please enter the total amount expended for salaries and wages for Centralized Support Services.
- In cell C21, please enter the amount of employee fringe benefits reported in Fixed Charges

(Category 212) that correspond to the salaries identified in cell B21, the salaries and wages for Centralized Support Services. Please see the instructions provided above for Cell C9 for directions on how to calculate total fringe benefits.

- Cell D21 shows the total amount expended for salaries and wages and fringe benefits for Centralized Support Services. Please enter this amount if the total does not calculate automatically.

The final section addresses costs associated with Instructional Administration and Supervision, identified in the Maryland *Financial Reporting Manual* with category code 20216. *Do not include any FTEs or expenditures for Instructional Administration and Supervision for special education programs (20616)*.

Please see the instructions provided above for Cell C9 for directions on how to calculate total fringe benefits for cells B29 through F29.

- In cells B27, C27, D27, E27, and F27, please enter the total Full Time Equivalent (FTE) of people working in each designated area under Instructional Administration and Supervision. For example, a person working full-time is 1.0 FTE. A person working 40 percent of the time is .4 FTE.

- In cells B28, C28, D28, E28, and F28, please enter the district's total expenditure for salaries and wages for each personnel category for Instructional Administration and Supervision. This amount should not include any expenditure for employee fringe benefits (employee-related Fixed Charges).

- In cells B29, C29, D29, E29, and F29, please enter the district's total expenditure for employee fringe benefits for each personnel category for Instructional Administration and Supervision. This amount comes from Fixed Charges (Category 212). Please see the instructions provided above for Cell C9 for directions on how to calculate total fringe benefits. Expenditures reported here should exclude employee fringe benefits.

- In cells B30, C30, D30, E30, and F30, please enter the total FTE of people in each personnel category that work exclusively with Limited English Proficient (LEP) students or administration of LEP programs, or their portion of time spent exclusively in this area related to Instructional Administration and Supervision. For example, if reporting partial time for a person enter .4 for someone who spends 40 percent of their time with the LEP program.

- In cells B31, C31, D31, E31, and F31, please enter the total FTE of people in each personnel category that work exclusively with at risk students or administration of at risk programs, or their portion of time spent exclusively in this area related to Instructional Administration and Supervision. For example, if reporting partial time for a person enter .4 for someone who spends 40 percent of their time working with at risk programs.

  By staff working with at risk students we mean staff who are funded through Title I or the State's Compensatory Education formula who provide supplemental services to students who are low-income, at risk of academic failure, or who have a record of disruptive behavior.

When entering teacher and other staff FTE, salary and wage expenditures, and fringe benefit expenditures for staff working with at risk students, if any of these staff are funded through Title I,

include only the Title I staff FTE and salary and benefit expenditures exceeding the school's federal comparability levels.

- In cell B37, please enter the total amount spent for Contractual Services (200) for programs 20121, 20122, 20123, and 20216.
- In cell C37, please enter the total amount spent for Supplies and Materials (300) for programs 20121, 20122, 20123, and 20216.
- In cell D37, please enter the total amount spent for Other Charges (400) for programs 20121, 20122, 20123, and 20216. Expenditures reported here should exclude employee fringe benefits.
- In cell E37, please enter the total amount spent for Equipment and Technology (554) for programs 20121, 20122, 20123, and 20216. Expenditures for Equipment and Technology should only include expenditures from the Current Expense Fund.

SCHOOL (MID-LEVEL) ADMINISTRATION TAB:

The questions in this tab only apply to expenditures for the Office of the Principal. Expenditures associated with this area are identified with category code 20215 in the Maryland *Financial Reporting Manual*. *Do not include any FTEs or expenditures of School Administration related to special education programs (Category 206)*.

All FTE and Personnel Costs data should be for staff working in the school as of September 30, 2014. Please include as school expenditures, if possible, the proportional share of the cost of central office controlled school administration resources that are regularly assigned to this school. For example, if there is an administrator whose salary costs are assigned to the central office but who spends 25 percent of her time performing administrative tasks directly for the school (for example, an assessment coordinator who is assigned to multiple schools), include this person as a .25 FTE in the school.

- In cells B7 through I7, please enter the total FTE of people working in each designated position under the Office of the Principal. For example, a person working full-time is 1.0 FTE. A person working 40 percent of the time is .4 FTE.

  If the school's principal is also assigned teaching responsibilities for part of the day on an ongoing basis please allocate his or her FTE, salary and wage expenditure, and fringe benefits expenditure between the Principal position on the School Administration tab and the appropriate position category on the School Instruction tab.

- In cells B8 through I8, please enter the school's total expenditure for salaries and wages for each personnel category for the Office of the Principal. This amount should not include any expenditure for employee fringe benefits.

- In cells B9 through I9, please enter the school's total expenditure for employee benefits for each personnel category for the Office of the Principal. This amount comes from Fixed Charges (Category 212).

  Fringe benefits should include the employer's share of FICA; Medicare; premiums for health insurance, life insurance, short- and/or long-term disability insurance, and workers' compensation insurance; and any other employee-related Fixed Charges. When reporting the employer's share of retirement contributions, please use 100 percent of the normal cost contributions for fiscal year

2017, assuming the teacher pension cost sharing as specified in the Budget Reconciliation Act of 2012 is fully phased in. The total for fringe benefits may be shown as an amount or as a percentage of total Salaries and Wages. Do not include any payments for retiree benefits.

- In cells B10 through I10 please enter the total FTE of people for each personnel category that work exclusively with Limited English Proficient (LEP) students or administration of LEP programs, or the portion of time spent exclusively in this area under the Office of the Principal. For example, if reporting partial time for a person enter .4 for someone who spends 40 percent of their time with the LEP program.

- In cells B11 through I11, please enter the total FTE of people in each personnel category that work exclusively with at risk Students or administration of at risk programs, or the portion of time spent exclusively in this area under the Office of the Principal. For example, if reporting partial time for a person enter .4 for someone who spends 40 percent of their time working with at risk programs.

  By staff working with at risk students we mean staff who are funded through Title I or the State's Compensatory Education formula who provide supplemental services to students who are low-income, at risk of academic failure, or have a record of disruptive behavior.

  When entering teacher and other staff FTE, salary and wage expenditures, and fringe benefit expenditures for staff working with at risk Students, if any of these staff are funded through Title I, include only the Title I staff FTE and salary and benefit expenditures exceeding the school's federal comparability levels.

- In cell B17, please enter the total amount spent for Contractual Services (200) for the Office of the Principal.

- In cell C17, please enter the total amount spent for Supplies and Materials (300) for the Office of the Principal.

- In cell D17, please enter the total amount spent for Other Charges (400) for the Office of the Principal. Expenditures reported here should exclude employee fringe benefits.

- In cell E17, please enter the total amount spent for Equipment and Technology (554) for the Office of the Principal. Expenditures for Equipment and Technology should only include expenditures from the Current Expense Fund.

SCHOOL INSTRUCTION TAB:

TO AVOID DOUBLE COUNTING ANY FUNDS; PLEASE MAKE SURE THE COSTS REPORTED HERE ARE UNIQUE TO THIS SECTION.

The first section addresses Instructional Salaries, identified in the Maryland *Financial Reporting Manual* as Category 203. We want to build this cost by personnel type so we can exclude those who work identifiable amounts of time with Limited English Proficient or at risk students. *Do not include any FTEs or expenditures of School Instruction related to special education programs (Category 206)*.

All FTE and Personnel Costs data should be for staff working in the school as of September 30, 2014.

Please include as school expenditures, if possible, the proportional share of the cost of central office controlled school instruction resources that are regularly assigned to this school. For example, if textbook purchases are assigned to the central office but you can identify the cost of textbooks purchased for this school in 2014-15, please report this expenditure as a school cost.

- In cells B6 through M6, please enter the total FTE of people working in each personnel category under Instructional Salaries. For example, a person working full-time is 1.0 FTE. A person working 40 percent of the time is .4 FTE.

- In cells B7 through M7, please enter the school's total expenditure for salaries and wages for each personnel category for Instructional Salaries. This amount should not include any expenditure for employee fringe benefits.

- In cells B8 through M8, please enter the school's total expenditure for employee fringe benefits for each personnel category for Instructional Salaries. This amount comes from Fixed Charges (Category 212).

  Fringe benefits should include the employer's share of FICA; Medicare; premiums for health insurance, life insurance, short- and/or long-term disability insurance, and workers' compensation insurance; and any other employee-related Fixed Charges. When reporting the employer's share of retirement contributions, please use 100 percent of the normal cost contributions for fiscal year 2017, assuming the teacher pension cost sharing as specified in the Budget Reconciliation Act of 2012 is fully phased in. The total for fringe benefits may be shown as an amount or as a percentage of total Salaries and Wages. Do not include any payments for retiree benefits.

- In cells B9 through M9, please enter the total FTE of people in the school in each designated area that work exclusively with Limited English Proficient (LEP) students or the portion of time spent exclusively in this area under Instructional Salaries. For example, if reporting partial time for a person enter .4 for someone who spends 40 percent of their time working with the LEP program.

- In cells B10 through M10 please enter the total FTE of people in the school in each designated area that work exclusively with at risk students or the portion of time spent exclusively in this area under Instructional Salaries. For example, if reporting partial time for a person enter .4 for someone who spends 40 percent of their time working with at risk programs.

By staff working with at risk students, we mean staff who are funded through Title I or the State's Compensatory Education formula who provide supplemental services to students who are low-income, at risk of academic failure, or have a record of disruptive behavior.

When entering teacher and other staff FTE, salary and wage expenditures, and fringe benefit expenditures for staff working with at risk students, if any of these staff are funded through Title I include only the Title I staff FTE and salary and benefit expenditures exceeding the school's federal comparability levels.

- In cell B16 please enter the school's total expenditure for stipends to employees working extracurricular or cocurricular activities for Instructional Salaries.

By extracurricular or cocurricular activities we mean school-sponsored activities under the guidance of qualified adults designed to provide opportunities for students to participate on an individual basis, in small groups, or in large groups at school events, public events, or a combination of these for purposes such as motivation, enjoyment, and improvement of skills. Cocurricular activities normally supplement the regular instructional program and include such activities as band, chorus, choir, speech, debate, and school-sponsored athletics. Participation usually is not required, and credit is not given (*Financial Reporting Manual for Maryland Public Schools*, 2009).

- In cell C16, please enter the school's total expenditure for substitutes for Instructional Salaries.

The next section addresses the costs associated with Instructional Textbooks/Supplies, identified in the Maryland *Financial Reporting Manual* as Category 204.

- In cell B22, please enter the amount attributable to the specific school if identifiable if not, please enter the district's total expenditure for Category 204 in cell B24. Only enter a districtwide amount if you are not able to break out an amount for the school.

The final section addresses all Other Instructional Costs, identified in the Maryland Financial Reporting Manual as Category 205. Please include any expenditures from the Current Expenses Fund for instructional equipment or technology (Object 554, Other Equipment) here.

- In cell B29 please enter the amount attributable to the specific school if identifiable; if not, please enter the district's total expenditure for Category 205 in cell B31.

OTHER SCHOOL COSTS TAB:

The questions in this tab address all other operating costs of the school or district excluding food service (Category 213), transportation (Category 209), adult education (Category 20512), and special education (Category 206).

Please include as school expenditures, if possible, the proportional share of the cost of central office controlled resources that are regularly assigned to this school. For example, if there is a staff person whose salary costs are assigned to the central office but who spends 25 percent of her time performing tasks directly for the school, include this person as a .25 FTE in the school.

- In cell B6, please enter the total expenditure for salary and wage attributable to the specific school for Student Personnel Services, Category 207, if identifiable. If not, please enter the district's total expenditure for Category 207 in cell B19. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell B7, please enter the total expenditure for employee fringe benefits attributable to the salary and wage amount entered in cell B6 for the specific school for Student Personnel Services, Category 207, if identifiable. If not, please enter the district's total expenditure for Category 207 in cell B20. Only enter a districtwide amount if you are not able to break out an amount for the school.

  Fringe benefits should include the employer's share of FICA; Medicare; premiums for health insurance, life insurance, short- and/or long-term disability insurance, and workers' compensation insurance; and any other employee-related Fixed Charges. When reporting the employer's share of retirement contributions, please use 100 percent of the normal cost contributions for fiscal year 2017, assuming the teacher pension cost sharing as specified in the Budget Reconciliation Act of 2012 is fully phased in. The total for fringe benefits may be shown as an amount or as a percentage of total Salaries and Wages. Do not include any payments for retiree benefits.

- In cell C6, please enter the total expenditure for salary and wage attributable to the specific school for Student Health Services, Category 208, if identifiable. If not, please enter the district's total expenditure for Category 208 in cell C19. If there are outside sources that provide services for this area, please enter the total amount they provide under Contractual Services in cell B11. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell C7, please enter the total expenditure for employee fringe benefits attributable to the salary and wage amount entered in cell C6 for the specific school for Student Health Services, Category 208, if identifiable. If not, please enter the district's total expenditure for Category 208 in cell C20. Please see the instructions provided above for Cell B7 for directions on how to calculate total fringe benefits. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell D6, please enter the total expenditure for salary and wage attributable to the specific school for Operation of Plant, Category 210, if identifiable. If not, please enter the district's total expenditure for Category 210 in cell D19. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell D7, please enter the total expenditure for employee fringe benefits attributable to the salary and wage amount entered in cell D6 for the specific school for Operation of Plant, Category 210, if identifiable. If not, please enter the district's total expenditure for Category 210 in cell D20. Please see the instructions provided above for Cell B7 for directions on how to calculate total fringe benefits. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell E6, please enter the total expenditure for salary and wage attributable to the specific school for Maintenance of Plant, Category 211, if identifiable. If not, please enter the district's total expenditure for Category 211 in cell E19. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell E7, please enter the total expenditure for employee fringe benefits attributable to the salary and wage amount entered in cell E6 for the specific school for Maintenance of Plant, Category 211, if identifiable. If not, please enter the district's total expenditure for Category 211 in cell E20. Please see the instructions provided above for Cell B7 for directions on how to calculate total fringe benefits. Only enter a districtwide amount if you are not able to break out

an amount for the school.

- In cell F6, please enter the total expenditure for salary and wage attributable to the specific school for Community Services, Category 214, if identifiable. If not, please enter the district's total expenditure for Category 214 in cell F19. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell F7, please enter the total expenditure for employee fringe benefits attributable to the salary and wage amount entered in cell F6 for the specific school for Community Services, Category 214, if identifiable. If not, please enter the district's total expenditure for Category 214 in cell F20. Please see the instructions provided above for Cell B7 for directions on how to calculate total fringe benefits. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell B11, please enter the total amount for Contractual Services (Object 200) attributable to the specific school in Categories 207, 208, 210, 211, and 214, if identifiable. If not, please enter the district's total expenditures for Object 200 in these Categories in cell B24. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell C11, please enter the total amount for Supplies and Materials (Object 300) attributable to the specific school in Categories 207, 208, 210, 211, and 214, if identifiable. If not, please enter the district's total expenditures for Object 300 in these Categories in cell C24. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell D11, please enter the total amount for Fixed Charges (Category 212) or Other Charges (Object 400 for Categories 207, 208, 210, 211, and 214) from the Current Expense Fund that have not already been entered elsewhere in the Expenditure Tool and are attributable to the specific school. This amount should not include any expenditures related to personnel costs, such as employee fringe benefits. If an amount for this specific school cannot be determined, please enter the district's total expenditures for Fixed Charges (Category 212) or Other Charges (Object 400 for Categories 207, 208, 210, 211, and 214) in cell D24. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell E11, please enter the total amount for Equipment/Technology (Object 554) from the Current Expense Fund attributable to the specific school in Categories 207, 208, 210, 211, and 214, if identifiable. If not, please enter the district's total expenditures for Object 554 in these Categories in cell E24. Only enter a districtwide amount if you are not able to break out an amount for the school.

- In cell F11, please enter any other expenditures from the Current Expense Fund that have not already been entered elsewhere in the Expenditure Tool and are attributable to the specific school if identifiable. If not, please enter the district's total amount for these expenditures in cell F24. Please note what these expenditures were for in the Notes or Questions not box at the bottom of the page. Only enter a districtwide amount if you are not able to break out an amount for the school.

THANK YOU FOR YOUR TIME!

Appendix C.2: Successful Schools Data-Collection Tool Tabs

GENERAL INFORMATION PAGE (Data will be entered in columns B-E and rows 5-35. Please see instructions for more information)				
School Information: (The questions in rows 5 - 17 refer to the identified school)				
		Lowest Grade	**Highest Grade**	
Grade Span				- In cells C5 and E5 please select the lowest (C5) and highest (E5) grades served by the identified school
Number of Students (FTE):		All Student counts should be from the September 30th, 2014 enrollment count.		
- Grades 1-12		- In cell B8 please enter the total number of students enrolled in grades 1-12.		
- Full-day kindergarten		- In cell B9 please enter the total number of enrolled full-day kindergarten students if any.		
- Half-day prekindergarten		- In cell B10 please enter the total number of enrolled half-day prekindergarten students if any.		
- Full-day prekindergarten		- In cell B11 please enter the total number of enrolled full-day prekindergarten students if any.		
Teacher Characteristics:	Please see instructions for guidance on teachers to include here and throughout the report. Use teacher staffing counts as of September 30, 2014			
Average Years of Experience of All Teachers		- In cell B15 please enter the average experience of all teachers working in the identified school.		
% of Teachers with Advanced Professional Certificate (APC) or National Board of Professional Teaching Standards Certification		- In cell B17 please enter the percent of all teachers working in the identified school who hold an APC or NBPTS certification.		
District Info:	**(If your district has more than one school identified and you have already provided this information, please skip this section)**			
Number of Students (FTE):		All Student counts should be from the September 30th, 2014 enrollment counts.		
- Half-day prekindergarten		- In cell B22 please enter the total number of enrolled half-day prekindergarten students if any.		
- Full-day prekindergarten		- In cell B23 please enter the total number of enrolled full-day prekindergarten students if any.		
- Full-day kindergarten		- In cell B24 please enter the total number of enrolled full-day kindergarten students if any.		
- Elementary		- In cell B25 please enter the total number of enrolled elementary students in the district.		
- Middle/Junior		- In cell B26 please enter the total number of enrolled middle school students in the district		
- High School		- In cell B27 please enter the total number of enrolled high school students in the district.		
Operating Expenditures:		- In cell B29 please enter the district's total operating expenditures for 2014-2015.		
Teacher Characteristics:	Please see instructions for guidance on teachers to include here and throughout the report. Use teacher staffing counts as of September 30, 2014			
Average Years of Experience of All Teachers		- In cell B33 please enter the average years experience for all teachers in the district.		
% of Teachers with Advanced Professional Certificate (APC) or National Board of Professional Teaching Standards Certification		- In cell B35 please enter the percent of all teachers working in the district who hold an APC or NBPTS certification.		
Notes or Questions:				

DISTRICT ADMINISTRATION PAGE (Data should be entered in columns B-F and rows 9-37)					
The number of FTE and Personnel Costs should be based on staff working in the district as of September 30, 2014.					
(If your district has more than one identified school and you have already provided this information, please skip this section.)					
General Support Services (20121)					
	Salaries and Wages 100	Fringe Benefits (Fixed Charges)	Total		
Total Personnel Costs			$0		
Business Support Services (20122)					
	Salaries and Wages 100	Fringe Benefits (Fixed Charges)	Total		
Total Personnel Costs			$0		
Centralized Support Services (20123)					
	Salaries and Wages 100	Fringe Benefits (Fixed Charges)	Total		
Total Personnel Costs			$0		
Instructional Administration and Supervision (20216)					
	Curriculum Specialist	Supervisors of Guidance & Psychological Services	Media/ Technology Specialist	Other Administrators/ Supervisors of Instruction	Clerical Staff in Area
# of FTE (as of September 30, 2014)					
Total Salary and Wage Expenditure					
Total Fringe Benefits Expenditure (Fixed Charges)					
# FTE who only work with English Language Learner Students					
# FTE who only work with At-Risk Students					
Non-Personnel Costs (For program accounts 20121, 20122, 20123, and 20216)					

	Contractual Services Object 200)	Supplies/ Materials (Object 300)	Other Charges* (Object 400)	Equipment/ Technology (Object 554)	
Total District Cost					
	*Expenditures reported here for Other Charges (400) should exclude employee fringe benefits.				
Notes or Questions:					

SCHOOL (MID-LEVEL) ADMINISTRATION PAGE (Data should be entered in columns B-I and rows 7-17)								
Office of Principal (20215)								
	Principal	Assistant or Vice Principals	Other School-Level Administrators	Business Managers	Secretaries/Clerks	Student Personnel Workers Account 20215	Aides in Expenditure Account 20215	Other Staff in Expenditure Account 20215
# of FTE (as of September 30, 2014)								
Total Salary and Wage Expenditure								
Total Fringe Benefits Expenditure (Fixed Charges)								
# FTE who only work with English Language Learner Students								
# FTE who only work with At-Risk Students								
Non-Personnel Costs (20215)								
	Contractual Services Object 200)	Supplies/ Materials (Object 300)	Other Charges* (Object 400)	Equipment/ Technology (Object 554)				
Total School Cost								
	*Expenditures reported here for Other Charges (400) should exclude employee fringe benefits.							
Notes or Questions:								

SCHOOL INSTRUCTION PAGE (Data should be entered in columns B-M and rows 6-31)												
Instructional Salaries (Category 203)												
	Teachers*	Long-Term Substitute Teachers	Coaches, mentor teachers, specialist teachers	Teacher Aids or Teaching Assistants	Librarians/ Media	Guidance Counselors	Social Workers	Therapists (OT/PT/Speech/Other	Psychologists	Itinerate Teachers	Other Para-professionals in Expenditure Account 203	Other Staff in Expenditure Account 203
# of FTE (as of September 30, 2014)												
Total Salary and Wage Expenditure												
Total Fringe Benefits Expenditure (Fixed Charges)												
# FTE who only work with English Language Learner Students												
# FTE who only work with At-Risk Students												
	*Do not include long-term substitute teachers in this column											
	Extracurricul	Substitutes	- In cell B16 please enter the school's total expenditure for stipends to employees working extracurricular activities for Instructional Salarie									
Total School Cost			- In cell C16 please enter the school's total expenditure for substitutes for Instructional Salaries									
Instructional Textbooks/Supplies (Category 204)												
	Total School											
Total School Cost		- In cell B22 please enter the amount attributable to the specific school if identifiable, if not please enter the district's total expenditure for Category 204 in cell B24.										
OR	OR											
Total Amount Spent by District for Category 204												
Other Instructional Costs (Category 205)												
Total School Cost		- In cell B29 please enter the amount attributable to the specific school if identifiable, if not please enter the district's total expenditure for Category 205 in cell B31.										
OR	OR											
Total Amount Spent by District for Category 205												
Notes or Questions:												

OTHER COSTS PAGE (Data should be entered in columns B-F and rows 6-24)					
	Student Personnel Services 207	Student Health Services 208	Operation of Plant 210	Maintenance of Plant 211	Community Services 214
Total School Cost					
Total Salary and Wage Expenditure					
Total Fringe Benefits Expenditure (Fixed Charges)					
Non-Personnel Costs	Contractual Services (Object 200)	Supplies/ Materials (Object 300)	Fixed/Other Charges* (Category 212/ Object 400)	Equipment/ Technology (Object 554)	Other Program Costs
Total School Cost					
	*Expenditures reported here for Fixed/Other Charges (Category 212/Object 400) should exclude employee fringe benefits.				
OR - IF NOT AVAILABLE BY SCHOOL, PLEASE ENTER TOTAL AMOUNT SPENT BY THE DISTRICT FOR EACH CATEGORY					
Total District Cost					
Total Salary and Wage Expenditure					
Total Fringe Benefits Expenditure (Fixed Charges)					
Non-Personnel Costs	Contractual Services (Object 200)	Supplies/ Materials (Object 300)	Fixed/Other Charges* (Category 212/ Object 400)	Equipment/ Technology (Object 554)	Other Program Costs
Total District Cost					
	*Expenditures reported here for Fixed/Other Charges (Category 212/Object 400) should exclude employee fringe benefits.				
Notes or Questions:					

COMMENTS PAGE (Enter any other comments, notes, concerns here)
Please enter other comments you may have below:

Appendix D

Impact of Changes in the Formula

Table D.1

Impact of Enrollment Count Changes

Districts	Student Count Greater of Single or Rolling Average w. Prek	Student Count Single Year w. Prek	Difference	Student Count Greater of Single or Rolling Average w. Prek	Student Count Single Year	Difference	% Difference
Allegany	9,070	9,005	65	$80,030,248	$79,456,709	$573,539	1%
Anne Arundel	79,263	79,263	-	$956,378,725	$956,378,725	-	0%
Baltimore City	85,890	85,890	-	$996,155,844	$996,155,844	-	0%
Baltimore	109,394	109,394	-	$1,267,569,114	$1,267,569,114	-	0%
Calvert	16,486	16,361	125	$193,539,839	$192,066,530	$1,473,309	1%
Caroline	5,626	5,626	-	$56,496,337	$56,496,337	-	0%
Carroll	26,957	26,556	401	$288,893,313	$284,582,481	$4,310,832	2%
Cecil	15,939	15,924	15	$173,412,439	$173,256,493	$155,946	0%
Charles	26,841	26,662	179	$308,093,992	$306,031,706	$2,062,286	1%
Dorchester	4,776	4,776	-	$47,960,734	$47,960,734	-	0%
Frederick	41,067	41,067	-	$467,811,601	$467,811,601	-	0%
Garrett	4,086	3,989	97	$36,052,703	$$35,200,483	$852,220	2%
Harford	38,397	38,264	133	$448,260,424	$446,699,967	$1,560,457	0%
Howard	53,704	53,704	-	$660,843,619	$660,843,619	-	0%
Kent	2,216	2,196	20	$22,256,851	$22,055,169	$201,682	1%
Montgomery	153,732	153,732	-	$1,950,252,010	$1,950,252,010	-	0%
Prince George's	125,957	125,957	-	$1,547,189,187	$1,547,189,187	-	0%
Queen Anne's	7,827	7,804	23	$78,602,152	$78,372,855	$229,297	0%
St. Mary's	17,962	17,962	-	$210,868,076	$210,868,076	-	0%
Somerset	3,061	3,061	-	$31,339,889	$31,339,889	-	0%
Talbot	4,718	4,717	-	$47,376,778	$47,376,778	-	0%
Washington	22,855	22,855	-	$237,971,479	$237,971,479	-	0%
Wicomico	15,019	15,014	5	$153,767,157	$153,718,526	$48,631	0%
Worcester	6,864	6,864	-	$70,277,559	$70,277,559	-	0%
Total	**877,707**	**876,643**	**1,064**	**$10,331,400,071**	**$10,319,931,871**	**$11,468,199**	

Table D.2

Impact of Prekindergarten Count

District	Student Count w. Preschool	Student Count w.o. Preschool	Difference	% Change	Total Program w. Preschool	Total Program w.o. Preschool	Difference	% Change
Allegany	9,070	8,379	691	8%	$106,193,944	$100,092,899	$6,101,045	6%
Anne Arundel	79,263	76,181	3,082	4%	$1,161,936,991	$1,124,752,118	$37,184,873	3%
Baltimore City	85,890	79,352	6,538	8%	$1,449,109,710	$1,373,284,710	$75,825,000	6%
Baltimore	109,394	104,358	5,036	5%	$1,636,358,800	$1,578,003,807	$58,354,993	4%
Calvert	16,486	15,948	538	3%	$225,294,976	$218,979,937	$6,315,039	3%
Caroline	5,626	5,235	391	7%	$73,873,587	$69,948,376	$3,925,211	6%
Carroll	26,957	26,351	606	2%	$338,196,159	$331,698,563	$6,497,596	2%
Cecil	15,939	15,114	824	5%	$220,398,254	$211,429,762	$8,968,492	4%
Charles	26,841	25,703	1,138	4%	$370,978,635	$357,918,741	$13,059,894	4%
Dorchester	4,776	4,505	271	6%	$63,156,163	$60,435,720	$2,720,443	5%
Frederick	41,067	39,472	1,596	4%	$560,038,906	$541,861,372	$18,177,534	3%
Garrett	4,086	3,882	204	5%	$45,089,530	$43,291,088	$1,798,442	4%
Harford	38,397	37,189	1,209	3%	$550,008,571	$535,897,566	$14,111,005	3%
Howard	53,704	51,630	2,074	4%	$66,474,431	$740,949,342	$25,525,089	3%
Kent	2,216	2,015	201	10%	$28,665,436	$26,644,536	$2,020,900	8%
Montgomery	153,732	147,462	6,269	4%	$2,467,169,557	$2,387,635,447	$79,534,110	3%
Prince George's	125,957	119,281	6,676	6%	$2,110,671,451	$2,028,669,742	$82,001,709	4%
Queen Anne's	7,827	7,494	333	4%	$95,172,967	$91,830,709	$3,342,258	4%
St. Mary's	17,962	16,890	1,072	6%	$252,865,758	$240,281,110	$12,584,648	5%
Somerset	3,061	2,727	334	12%	$43,559,075	$40,138,430	$3,420,645	9%
Talbot	4,718	4,299	419	10%	$58,485,958	$54,275,748	$4,210,209	8%
Washington	22,855	21,939	916	4%	$300,346,598	$290,810,101	$9,536,497	3%
Wicomico	15,019	13,934	1,085	8%	$203,312,762	$192,205,571	$11,107,190	6%
Worcester	6,864	6,249	615	10%	$89,045,641	$82,745,843	$6,299,798	8%
Total	**877,707**	**835,589**	**42,118**	**5%**	**$13,216,403,859**	**$12,723,781,238**	**$492,622,622**	**4%**

Table D.3a
Impact of CWI on Total Program Amount*

	Total Program Amount with CWI	Total Program Amount without CWI	Difference	% Difference
Allegany	$106,193,944	$130,941,978	$(24,748,034)	-19%
Anne Arundel	$1,161,936,991	$1,047,733,987	$114,203,005	11%
Baltimore City	$1,449,109,710	$1,359,389,971	$89,719,738	7%
Baltimore	$1,636,358,800	$1,536,487,136	$99,871,664	6%
Calvert	$225,294,976	$208,799,793	$16,495,184	8%
Caroline	$73,873,587	$80,036,389	$(6,162,802)	-8%
Carroll	$338,196,159	$343,346,354	$(5,150,195)	-2%
Cecil	$220,398,254	$220,398,254	-	0%
Charles	$370,978,635	$351,638,517	$19,340,118	5%
Dorchester	$63,156,163	$68,424,879	$(5,268,716)	-8%
Frederick	$560,038,906	$534,898,669	$25,140,237	5%
Garrett	$45,089,530	$55,597,447	$(10,507,918)	-19%
Harford	$550,008,571	$512,589,534	$37,419,036	7%
Howard	$766,474,431	$677,696,225	$88,778,206	13%
Kent	$28,665,436	$31,056,810	$(2,391,374)	-8%
Montgomery	$2,467,169,557	$2,115,925,864	$351,243,693	17%
Prince George's	$2,110,671,451	$1,869,505,271	$241,166,180	13%
Queen Anne's	$95,172,967	$103,112,640	$(7,939,673)	-8%
St. Mary's	$252,865,758	$234,351,954	$18,513,804	8%
Somerset	$43,559,075	$46,290,197	$(2,731,122)	-6%
Talbot	$58,485,958	$63,365,068	$(4,879,110)	-8%
Washington	$300,346,598	$313,841,795	$(13,495,197)	-4%
Wicomico	$203,312,762	$216,060,321	$(12,747,559)	-6%
Worcester	$89,045,641	$94,628,736	$(5,583,095)	-6%
Total	**$13,216,403,859**	**$12,216,117,789**	**$1,000,286,071**	**8%**

*Consists of the foundation, compensatory education, LEP, and special education programs.

Table D.3b

State and Local Shares of CWI Impact on Total Program Amount*

District	State Share of CWI Cost	Local Share of CWI Cost	Total CWI Cost
Allegany	$(26,342,068)	$1,594,034	$(24,748,034)
Anne Arundel	$51,856,540	$62,346,465	$114,203,005
Baltimore City	$75,048,020	$14,671,718	$89,719,738
Baltimore	$37,010,482	$62,861,182	$99,871,664
Calvert	$9,515,213	$6,979,971	$16,495,184
Caroline	$(7,042,088)	$879,287	$(6,162,802)
Carroll	$(16,620,941)	$11,470,745	$(5,150,195)
Cecil	$(4,461,435)	$4,461,435	$0
Charles	$11,322,577	$8,017,542	$19,340,118
Dorchester	$(6,399,061)	$1,130,345	$(5,268,716)
Frederick	$9,852,015	$15,288,222	$25,140,237
Garrett	$(12,551,586)	$2,043,668	$(10,507,918)
Harford	$20,881,905	$16,537,131	$37,419,036
Howard	$50,319,902	$38,458,303	$88,778,205
Kent	$(392,391)	$(1,998,984)	$(2,391,374)
Montgomery	$161,887,137	$189,356,557	$351,243,693
Prince George's	$203,781,931	$37,384,249	$241,166,180
Queen Anne's	$(12,026,275)	$4,086,602	$(7,939,673)
St. Mary's	$11,732,625	$6,781,180	$18,513,804
Somerset	$(3,170,309)	$439,187	$(2,731,122)
Talbot	$0	$(4,879,110)	$(4,879,110)
Washington	$(18,936,520)	$5,441,323	$(13,495,197)
Wicomico	$(15,226,658)	$2,479,099	$(12,747,559)
Worcester	$0	$(5,583,095)	$(5,583,095)
Total	$520,039,015	$480,247,056	$1,000,286,070

*Consists of the foundation, compensatory education, LEP, and special education programs.

Table D.4

Differences between Multiplicative and Additive Approaches*

District	Additive State Share	Multiplicative State Share	Difference	% Difference	Additive Local Share	Multiplicative Local Share	Difference	%Difference
Allegany	$67,470,603	$84,760,301	$17,289,698	26%	$38,723,341	$21,433,643	$ 17,289,698)	-45%
Anne Arundel	$420,459,602	$338,187,597	$ (82,272,005)	-20%	$741,477,389	$823,749,394	$82,272,005	11%
Baltimore City	$1,088,759,048	$1,255,260,400	$166,501,352	15%	$360,350,661	$193,849,309	$ 166,501,352)	-46%
Baltimore	$794,951,043	$805,808,718	$10,857,675	1%	$841,407,757	$830,550,082	$(10,857,675)	-1%
Calvert	$110,284,633	$132,316345	$22,031,712	20%	$115,010,344	$92,978,632	$(22,031,712)	-19%
Caroline	$49,824,768	$62,256,061	$12,431,293	25%	$24,048,819	$11,617,526	$(12,431,293)	-52%
Carroll	$157,671,389	$182,371,694	$24,700,305	16%	$180,524,770	$155,824,465	$(24,700,305)	-14%
Cecil	$130,470,625	$160,424,468	$29,953,843	23%	$89,927,629	$59,973,786	$(29,953,843)	-33%
Charles	$215,912,112	$263,859,425	$47,947,313	22%	$155,066,523	$107,119,210	$(47,947,313)	-31%
Dorchester	$37,173,179	$48,221,525	$11,048,346	30%	$25,982,984	$14,934,638	$(11,048,346)	-43%
Frederick	$300,624,988	$358,044,072	$57,419,084	19%	$259,413,918	$201,994,834	$(57,419,084)	-22%
Garrett	$7,911,706	$17,831,996	$9,920,290	125%	$37,177,824	$27,257,534	$(9,920,290)	-27%
Harford	$287,515,134	$329,614,473	$42,099,339	15%	$262,493,436	$220,394,097	$(42,099,339)	-16%
Howard	$316,411,856	$284,723,521	$(31,688,335)	-10%	$450,062,575	$481,750,910	$31,688,335	7%
Kent	$2,711,254	$0	$(2,711,254)	-100%	$25,594,182	$28,665,436	$2,711,254	12%
Montgomery	$781,964,849	$210,685,890	$(571,278,959)	-73%	$1,685,204,708	$2,256,483,667	$571,278,959	34%
Prince George's	$1,385,585,044	$1,616,734,015	$231,148,971	17%	$725,086,407	$493,937,436	$(231,148,971)	-32%
Queen Anne's	$28,601,540	$31,948,463	$3,346,923	12%	$66,571,427	$63,224,504	$(3,346,923)	-5%
St. Mary's	$137,894,021	$162,528,290	$24,634,269	18%	$114,971,737	$90,337,468	$(24,634,269)	-21%
Somerset	$30,765,317	$37,756,339	$6,991,022	23%	$12,793,758	$5,802,736	$(6,991,022)	-55%
Talbot	$0	$0	$0	0%	$58,485,958	$58,485,958	$0	0%
Washington	$182,441,600	$228,453,419	$46,011,819	25%	$117,904,998	$71,893,179	$(46,011,819)	-39%
Wicomico	$140,514,364	$170,557,795	$30,043,431	21%	$62,798,398	$32,754,966	$(30,043,432)	-48%
Worcester	$0	$0	$0	0%	$89,045,641	$89,045,641	$0	0%
Total	**$6,675,918,675**	**$6,782,344,807**	**$106,426,132**		**$6,540,485,184**	**$6,434,059,051**	**$(106,426,133)**	

*Excludes student transportation.

Table D.5

Differences between Minimum State Aid Guarantees and No State Aid Guarantees*

District	Foundation State Share w. Minimum Aid Guarantees	Foundation State Share w.o Minimum Aid Guarantees	Difference	% Change	Special Need Weights State Share w. Minimum Aid Guarantees	Special Need Weights State Share w.o. Minimum Aid Guarantees	Difference	%Change
Allegany	$63,005,569	$63,005,569	-	0%	$21,774,497	$21,754,732	$(19,765)	0%
Anne Arundel	$312,445,304	$312,445,304	-	0%	$78,798,760	$25,742,293	$(53,056,467)	-67%
Baltimore City	$844,621,834	$844,621,834	-	0%	$410,638,566	$410,638,566	-	0%
Baltimore	$618,319,525	$618,319,525	-	0%	$192,726,059	$187,489,193	$(5,236,866)	-3%
Calvert	$119,925,434	$119,925,434	-	0%	$14,229,067	$12,390,910	$(1,838,157)	-13%
Caroline	$47,414,797	$47,414,797	-	0%	$14,841,264	$14,841,264	-	0%
Carroll	$165,298,372	$165,298,372	-	0%	$24,701,378	$17,073,321	$(7,628,057)	-31%
Cecil	$126,104,957	$126,104,957	-	0%	$34,540,375	$34,319,511	$(220,864)	-1%
Charles	$223,682,886	$223,682,886	-	0%	$40,613,636	$40,176,539	$(437,097)	-1%
Dorchester	$36,286,173	$36,286,173	-	0%	$11,963,375	$11,935,352	$(28,023)	0%
Frederick	$309,910,150	$309,910,150	-	0%	$48,133,922	$48,133,922	-	0%
Garrett	$14,359,473	$14,359,473	-	0%	$4,089,044	$3,472,523	$(616,522)	-15%
Harford	$273,958,856	$273,958,856	-	0%	$56,239,096	$55,655,617	$(583,479)	-1%
Howard	$272,574,368	$272,574,368	-	0%	$39,775,514	$12,149,153	$(27,626,361)	-69%
Kent	$3,338,528	-	$(3,338,528)	-100%	$2,643,025	-	$(2,643,025)	-100%
Montgomery	$292,537,802	$149,422,769	$(143,115,032)	-49%	$207,945,893	$61,263,121	$(146,682,772)	-71%
Prince George's	$1,161,073,185	$1,161,073,185	-	0%	$455,660,831	$455,660,831	-	0%
Queen Anne's	$28,219,832	$28,219,832	-	0%	$6,931,752	$3,728,631	$(3,203,121)	-46%
St. Mary's	$139,565,742	$139,565,742	-	0%	$23,273,176	$22,962,548	$(310,628)	-1%
Somerset	$26,803,830	$26,803,830	-	0%	$10,952,509	$10,952,509	-	0%
Talbot	$7,106,517	-	$(7,106,517)	-100%	$4,561,383	-	$(4,561,383)	-100%
Washington	$181,771,837	$181,771,837	-	0%	$ 47,159,608	$46,681,582	$(478,026)	-1%
Wicomico	$128,162,261	$128,162,261	-	0%	$42,395,535	$42,395,535	-	0%
Worcester	$10,541,634	-	$(10,541,634)	-100%	$7,699,537	-	$(7,699,537)	-100%
Total	**$5,407,028,866**	**$5,242,927,154**	**$(164,101,711)**	**-3%**	**$1,802,287,803**	**$1,539,417,653**	**$(262,870,150)**	**-15%**

*Consists of the foundation, compensatory education, LEP, and special education state aid programs.

Appendix E:

An Estimate of the Cost of Providing High-Quality Early Childhood Education to Low-Income Three-Year-Olds

It is not a recommendation of the study team that the State should fund high-quality preschool for three-year-old low-income children. Though the research studies have identified a modest gain for low-income children receiving two years of quality preschool, that gain is significantly lower than providing a high-quality preschool experience for four-year-old children. The study team recommendation covers only four-year-old children. See Workman, S., Palaich, R., & Wool, S. (2016, January). A Comprehensive Analysis of Prekindergarten in Maryland. Denver, CO: Augenblick, Palaich & Associates.

That said, several requests have been made to the Maryland partners and the study team for an estimate of the cost of providing high-quality early childhood education to low-income three-year-olds. The study team had the data that could be used to generate this estimate, and the estimate is presented in this Appendix.

Several figures and underlying assumptions were accounted for in the process of generating the cost estimate for serving low-income three-year-olds. They include the following.

- The number of three-year-olds in the state. The study team used the same sources and procedures that were used to generate the number four-year- olds used in the prekindergarten report to estimate the cost of providing high-quality preschool services in the year before kindergarten. For this cost estimate we have created the three-year-old count in the same manner using census data. The statewide figure for three-year- olds was 76,635.

- An estimate of the percentage of the total number of children that come from families with low incomes. There are several ways of deriving this percentage and there are several counts on which it can be based. For the purpose of this estimate, the study team used the statewide average of the school-based FRPMs (free and reduced priced meals) count. On a statewide basis, 29.4 percent of the State's children are FRPMs eligible. Applying this percentage results in a figure of 22,531 low-income, three-year-old children.

- At this point, it is typical to remove the percentage of the students from families that would choose *not* to send their children to preschool or childcare. Statewide for all students, the figure used in the four-year-old cost analysis was 26 percent. For the sub-population of low-income families, we would expect a smaller percentage of families opting out of the opportunity. The study team selected a factor of 10 percent that would opt out of the service opportunity. This results in a figure of 20,278 low-income, three-year-old children likely to participate.

- The next factor that must be taken into consideration is the distribution of children across types of Early Childhood Education (ECE) sites. The choices include public schools, centers, family homes and Head Start sites. The study team applied the same distribution across these four types of sites as was found in the distribution of the general population. Forty-eight percent of the population would attend a public school program, 42 percent of the population would attend a center-based program, four percent would attend a program in a family home and six percent would attend a Head Start program. Since Head Start programs are funded independently, children attending these programs were removed from the funding analysis. This results in a figure of 19,061 likely to participate, low-income, three-year-old children.

- The final factor taken into consideration is the quality ratings used by the State, EXCELS. In the analysis of four-year-old prekindergarten students, only those children attending public-school prekindergarten programs or those attending private preschool which have received a rating of EXCELS Level 5 or have outside accreditation are eligible for state support. The estimate of this number is 11,437 children attending public or private settings that meet the high-quality criteria. This figure represents 60 percent of likely to participate, low-income, three-year-old children excluding Head Start.

Applying the per-child cost of quality figures by type of site reported in Table 40 of the study team's prekindergarten report, the cost of serving existing (60 percent), low-income three-year-olds in Maryland would be just under $135 million. To fund 80 percent of those likely to participate (an additional 3,800 students), the additional cost would be approximately $45 million. Table E1 illustrates the counts of children and the costs associated with the high-quality sites attended by the children from low-income families. These counts and costs are further distributed across districts using the number of four-year-old children by district developed in the prekindergarten report; see Table 2 of the study team's prekindergarten report.

Table E.1

Funding Required To Serve 60 or 80 Percent of Three-Year-Olds in High-Quality Programs

District	Estimated Three-Year-Old, Low Income Count	Estimated 60 Percent Three-Year-Old, Low Income Count	Estimated 80 Percent Three-Year-Old, Low Income Count	Estimated Cost for Current (60 Percent) Coverage	Estimated Cost for 80 Percent Coverage
Allegany	289	173	231	$2,040,586	$2,720,782
Anne Arundel	1,572	943	1,258	$11,117,501	$14,823,334
Baltimore City	2,432	1,459	1,945	$17,195,951	$22,927,934
Baltimore	2,569	1,541	2,055	$18,166,567	$24,222,089
Calvert	269	161	215	$1,903,019	$2,537,358
Caroline	190	114	152	$1,340,010	$1,786,681
Carroll	444	267	355	$3,141,127	$4,188,169
Cecil	316	190	253	$2,236,747	$2,982,330
Charles	535	321	428	$3,785,657	$5,047,542
Dorchester	105	63	84	$743,884	$991,845
Frederick	757	454	605	$5,349,851	$7,133,135
Garrett	71	43	57	$504,415	$672,553
Harford	733	440	586	$5,181,713	$6,908,951
Howard	1,002	601	801	$7,082,184	$9,442,912
Kent	67	40	54	$476,392	$635,189
Montgomery	3,205	1,923	2,564	$22,660,442	$30,213,922
Prince George's	2,601	1,561	2,081	$18,395,846	$24,527,794
Queen Anne's	150	90	120	$1,057,233	$1,409,643
Saint Mary's	424	254	339	$2,998,464	$3,997,952
Somerset	159	96	127	$1,126,016	$1,501,355
Talbot	155	93	124	$1,092,898	$1,457,198
Washington	460	276	368	$3,250,672	$4,334,229
Wicomico	349	210	280	$2,471,122	$3,294,829
Worcester	208	125	166	$1,469,935	$1,959,914
Statewide Totals	**19,061**	**11,437**	**15,249**	**$134,788,230**	**$179,717,640**

Source: APA calculations based on MSDE data

The estimates presented in Table E1 are not adjusted for existing or future funding streams. The majority of state and federal contribution were already accounted for in the four-year-old analysis presented in the "A Comprehensive Analysis of Prekindergarten in Maryland" report. Further parsing of existing funds would be problematic and is beyond the scope of this analysis.

Appendix F: Full Report and School Case Studies for the Evidence-Based Approach to Estimating a Base Spending Level and Pupil Weights for Maryland

Prepared for

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Submitted by

APA Consulting

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APA CONSULTING | AUGENBLICK, PALAICH AND ASSOCIATES

Picus Odden & Associates

MARYLAND EQUITY PROJECT
ADVANCING EDUCATIONAL OPPORTUNITIES

In 2002, the Maryland General Assembly enacted Section 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 Act was phased in over six years, reaching full implementation in fiscal year 2008. Section 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 will be based on Maryland's College and Career-Ready Standards (MCCRS) adopted by the State Board of Education. The adequacy cost study will include two years of results from new state assessments aligned with the standards. These assessments are scheduled to be administered beginning in the 2014-2015 school year.

There are several additional components mandated to be included in the study. These components include evaluations of (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 and Associates and the Maryland Equity Project at the University of Maryland, will submit a final report to the State no later than November 30, 2016.

This appendix consists of the full Evidence-Based Report, which describes the evidence-based model, one of the three approaches used for estimating adequacy for the study of adequacy funding for education in the State of Maryland; and the individual reports for 12 high performing schools selected for case studies as part of the evidence-based study.

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Chapter I: Using the Evidence-Based Approach to Identify a Base Spending Level and Pupil Weights for the Maryland School Funding System

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Section 1: The Maryland Evidence-Based School Finance Adequacy Study

One of the critical questions facing school finance today is this: How much does it cost to provide the resources needed to implement education programs that will ensure all students have an opportunity to meet their state's proficiency standards and be prepared for college and/or careers? This document, prepared as part of the Maryland School Finance Adequacy Study, uses the evidence-based (EB) model (Odden & Picus, 2014) to provide the State with a base funding amount and student weights estimates for such a system.

Following this introductory section, Section 2 provides a brief description of the EB model and the school improvement model that supports it. Section 3 offers a detailed description of the EB model, describing the personnel resources needed for regular education programs, along with estimated dollar per pupil resources needed for instructional materials, technology, and other support services. In addition, Section 3 describes the additional resources needed for students who are struggling to meet grade-level standards and offers estimates of the resources needed at the central office to provide for maintenance and operations. Transportation and food services are not included in this model.

Education professionals from across Maryland have reviewed this analysis. Specifically, the study team invited four EB professional judgment (EBPJ) panels to review the EB model's components and provide feedback on its adequacy. The panels were asked to recommend any changes necessary to ensure adequacy in the State of Maryland. Their recommendations and potential cost implications of those changes are described in Section 4.

The study team also sought to identify the strategies that successful and, when possible, improving schools employ in Maryland. To that end, the study team conducted daylong case studies in 12 schools. The case studies provided information on multiple aspects of 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 detailed case study write-ups are included in the appendix to this report, and a cross-site analysis is provided in Section 5.

To estimate a per pupil foundation amount, the study team developed an Excel-based model that takes all the report's recommendations and calculates a base per pupil figure, together with weights for poverty students, LEP students, and students with mild and moderate disabilities. Section 6 includes these figures.

Section 2: The School Improvement Model

The intent of Maryland's school funding model is to identify the costs of providing a basket of educational goods and services that allows each school and school district to provide all students an equal opportunity to meet the state's student performance standards. Although a direct linkage between funding and student performance does not exist, the intent of this adequacy study is to identify a base per pupil spending level and weights for students from economically disadvantaged or limited English proficient (LEP) backgrounds and/or with disabilities. This adequacy study aims to

provide all students with robust opportunities to meet State College and Career-Ready Standards (CCRS). Regardless of whether high school graduates go on to college or enter the workforce, today's global, knowledge-based economy requires a similar set of skills and expertise for every graduate.

No matter what course of studies a high school student completes – college prep or career tech – all Maryland students are expected to achieve to CCRS. This includes children from low-income homes, students of color, LEP students, and students with disabilities. Since the 2001 Thornton Commission,[1] Maryland's policy makers have sought to provide adequate funding to meet this goal and continue to work to ensure the funding model meets the needs of all students. The current study is designed to update the core elements of the State's school funding formula – base foundation expenditure per pupil level and extra pupil weights for low-income students, LEP students, and students with disabilities – to ensure they are adequate to meeting today's CCRS.

Before presenting the EB analysis that will be used as one of three approaches for recalibrating these key elements of the Maryland funding model, this section provides a description of the school improvement model that undergirds the EB model. The expectation is that funds provided through the school funding formula will be used to boost student achievement and close achievement gaps. This section contains a more explicit and detailed description of the school improvement model embedded in the EB approach to adequate school funding. The concept is to link the level of funding with its effective use. The EB model not only identifies a base level of staff and dollar resources, and extra resources for students struggling to meet standards, but also outlines how resources can be used to boost student performance.

The School Improvement Model Embedded in the Evidence-Based Approach

The EB model, used to estimate an adequate spending level for schools, has been designed to allow districts and schools to provide every child with an equal opportunity to meet state performance standards, which are currently the Common Core and CCRS. The EB model is unique because 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, which have been developed from that research, have 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 model 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."

[1] Commission on Education Finance, Equity, and Excellence. (2002). *Commission on Education Finance, Equity, and Excellence: Final Report*. Annapolis, MD: State of Maryland, Department of Legislative Services.

2. Studies of schools and districts that have dramatically improved student performance over a four- to six-year period – sometimes labeled "a doubling of student performance" on state tests.

An Overview of the Evidence-Based School Improvement Model

As a result of the study team's research and work in other states, the EB approach has become more explicit in identifying the components of a school improvement model. It also better articulates how all the elements in the funding model are linked at the school-level to strategies that, when implemented, produce notable improvements in student achievement (Odden & Picus, 2014).

Improving and high-performing schools have clear and specific student achievement goals, including goals to reduce achievement gaps linked to poverty and minority status. The goals are nearly always specified in terms of performance on state assessments.

Compared to traditional schools where teachers work in isolated classrooms, improving schools organize instruction differently. Regardless of the context – urban, suburban, rural, high-income or low-income – improving and high-performing schools organize teachers into collaborative teams: grade-level teams in elementary schools, and subject or course teams in secondary schools. With the guidance and support of instructional coaches, the teacher teams work with student data (usually short cycle or formative assessment) to:

- Plan and develop standards-based curriculum units;
- teach those units simultaneously;
- debrief on how successful the units were; and
- make changes when student performance does not meet expectations.

This collaborative teamwork makes instruction "public" over time by identifying a set of instructional strategies that work in the teachers' school. Over time, all teachers are expected to use the instructional strategies that have been demonstrated to improve student learning and achievement.

Improving and high-performing schools also provide an array of extra help programs for students struggling to achieve to standards. This is critical because the number of students at risk of academic failure is likely to increase as more rigorous curriculum programs are implemented to prepare all students for college and careers. Individual tutoring, small group tutoring, after-school academic help, and summer school programs focused on reading and mathematics for younger students and courses needed for high school graduation for older students. These programs represent the array of extra help strategies the improving schools deploy. The idea is to hold standards constant and vary instructional time.

These schools exhibit dense leadership. Teachers lead by coordinating collaborative teams and through instructional coaching. Principals lead by structuring the school to foster instructional improvement. The district leads by ensuring that schools have the resources to deploy the strategies outlined above,

focusing on aggressive student performance goals, improving instructional practice, and taking responsibility for student achievement results.

High-performing and improving schools seek out top talent. They know that preparing students for the competitive and knowledge-based global economy is difficult and requires smart and capable teachers and administrators to educate all students effectively.

The study team has continued to enhance the details of the school improvement strategy embedded in the EB funding model. The study team has summarized its findings in a recent textbook (Odden & Picus, 2014) and several books profiling schools and districts that have moved the student achievement needle (Odden & Archibald, 2009; Odden, 2009; Odden, 2012). The team has also studied dramatically improving schools in Vermont and Maine as part of school finance studies recently completed in both states. The team found the theory of improvement embodied in the EB model was reflected in nearly all these successful schools (Picus, Odden, et al., 2011; Picus, Odden, et al., 2013). In addition, other researchers and analysts have found similar features in schools that significantly improve student performance and reduce achievement gaps (Blankstein, 2010, 2011; Chenoweth, 2007, 2009). The study team has developed similar case descriptions of improving schools in Maryland as part of this study.

In a recent book, Greg Duncan and Richard Murnane (2014) reached similar conclusions on how schools boost student learning. They note that for all students to have a chance at success in the emerging global economy they will need high-quality preschool programs followed by effective elementary and secondary schools. The key features needed in each school include: (1) leadership focused on improving instructional practice, (2) in-school organization of teachers into teams that over time create a set of effective instructional practices and deploy them systematically in all classrooms, (3) a culture of assistance (e.g. instructional coaches, ongoing professional development (PD)) and accountability (e.g. adults taking responsibility for the impact of their school actions on student performance), and (4) an array of extra help strategies to extend learning time for any student who needs more time to achieve to standards.

Although study details of improving and high-performing schools vary, and authors highlight somewhat different elements of the process, the overall findings are more similar than different. These key findings suggest all schools can improve if they have adequate resources, which is a goal of the current adequacy studies. The key to dramatic improvement in student learning is for schools and districts to deploy those adequate resources effectively.

The 10 Strategies in the Evidence-Based School Improvement Model

For clarity, the elements of the school improvement strategy embedded in the EB funding model are organized into 10 areas.

In general, findings indicate that schools and districts that produce large gains in student performance follow 10 similar strategies (Odden, 2009; Odden & Picus, 2014) that are supported by the resources included in the EB model. The 10 strategies are listed below:

1. Analyze student data to become deeply knowledgeable about performance issues and to understand the nature of the achievement gap. The test score analysis usually first includes review of state test results and then analysis of formative/short cycle (e.g. Renaissance Learning STAR Enterprise) and benchmark assessments (e.g. NWEA MAP). These analyses help tailor instruction to student needs; monitor progress of students with an Individual Education Plan (IEP) to determine whether interventions are working; and, follow the progress of students, classrooms, and schools over the course of the academic year. Improving schools are "performance data-hungry."

2. Set higher goals, such as aiming to educate at least 95 percent of the students in the school to proficiency or higher on state reading and math tests; attain advanced achievement levels for a significant portion of the school's students; increase the number of high school students taking and passing Advanced Placement (AP) classes; and make significant progress in closing the achievement gap. These goals tend to be numerically explicit and far beyond just producing "improvement" or "making adequate yearly progress (AYP)." Further, because the goals are ambitious, they help the school produce large gains in student performance, even when not fully attained.

3. Review evidence on good instruction and effective curricula. Successful schools throw out the old curricula, replace them with different and more rigorous curricula, and create their specific view of what good instructional practice is needed to deliver it. Changing curricula is necessary for schools implementing more rigorous CCRS, and such new curricula require changes in instructional practice. Successful schools also want all teachers to learn and implement new instructional strategies in their classrooms, so they also seek to make good instructional practice systemic to the school and not idiosyncratic to a teacher's individual classroom.

4. Invest heavily in teacher training that includes intensive summer institutes and longer teacher work years, provide resources for trainers, and fund instructional coaches in all schools. Time is provided during the regular school day for teacher collaboration focused on improving instruction. Nearly all improving schools have found resources to fund instructional coaches to work with school-based teacher data teams, model effective instructional practices, observe teachers, and give helpful, direct feedback. This focus has intensified now that schools are delivering more rigorous curricula focused on educating all students to college and career proficiency levels. In addition, staff PD is viewed as an ongoing activity, not a "once and done."

5. Provide extra help for students at risk of academic failure and, with a combination of state and federal Title I funds, provide some combination of tutoring in a one-to-one, one-to-three, or one-to-five tutor-to-student format. In some cases, this includes extended days, summer school, and English language development for all LEP students. These Tier 2 interventions in the Response to Intervention (RTI) approach to helping students at risk of academic failure achieve to standards were absolutely critical. For many students, one dose of even high-quality instruction is not enough. Many students need a combination of extra help services to achieve to their potential. No school producing large gains in student learning ignored these extra help strategies altogether or argued that small classes or prekindergarten were substitutes.

6. Restructure the school day to provide more effective ways to deliver instruction. This can include multi-age classrooms in elementary schools and block schedules and double periods of mathematics and reading in secondary schools. Schools also protect instructional time for core subjects, especially reading and mathematics. Further, most improving schools today organize teachers into collaborative teams – grade-level teams in elementary schools and subject/course teams in secondary schools. These teams meet during the regular school day, often daily, and collaboratively develop curriculum units, lesson plans to teach them, and common assessments to measure student learning. Further, teams debrief on the impact of each collaboratively developed unit, reviewing student learning overall and across individual classrooms.

7. Provide strong leadership and support for data-based decision making and improving the instructional program, usually through the superintendent, principal, and teacher leaders. Instructional leadership is “dense” and “distributed” in successful schools; leadership derives from the teachers coordinating collaborative teacher teams, from instructional coaches, the principal, and district leaders. Both teachers and administrators provide an array of complementary instructional leadership.

8. Create professional school cultures characterized by ongoing discussion of good instruction and teachers taking responsibility for the student performance results of their actions. Over time, the collaborative teams that deliver instruction produce a school culture characterized by: (1) high expectations of performance on the part of both students and teachers, (2) a systemic and school-wide approach to effective instruction, (3) a belief that instruction is public and good instructional practices are expected to be implemented by each individual teacher, and (4) an expectation that the adults in the school are responsible for the achievement gains made (or not made) by students. Professionals in these schools accept responsibility for student achievement results.

9. Bring external professional knowledge into the school (e.g. hiring experts to provide training, adopting research-based new curricula, discussing research on good instruction, and working with regional education service agencies as well as the state department of education). Successful schools do not attain their goals by "pulling themselves up by their own bootstraps." They aggressively seek outside knowledge, find similar schools that produce results and benchmark their practices to them, and operate in ways that typify other professions.

10. Recruit and retain the best talent. Many improving schools today consciously seek to recruit and retain the best talent, from effective principal leaders to knowledgeable, committed, and effective teachers. They seek individuals who are mission-driven to boost student learning, who are willing to work in a collaborative environment where all teachers are expected to acquire and deliver the school's view of effective instructional practice, and who are focused on accountability.

In sum, the schools that have boosted student performance deployed strategies that are strongly aligned with those embedded in the EB model. Further, in the study team's adequacy and recalibration work in many other states, including Maine, North Dakota, Washington, Wisconsin, and Wyoming, the study team found that most educators shared this view of how schools can increase student performance. These practices bolster the study team's claim that if funds are provided and used to implement these effective strategies, significant student performance gains follow.

Finally, as noted above, the study team conducted school case studies in Maryland to determine whether school improvement in the State is similar to or different from this model.

Section 3: Using the Evidence-Based Model to Identify a Base Spending Level and Pupil Weights

This section describes the components of the EB model used to build a foundation for estimating a new base spending level, along with pupil weights for at risk students, LEP students, and students with disabilities. The five parts of this section include the following:

- 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 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, PD, computers and other technology, instructional materials and supplies, and extra duty/student activities;
- central functions including maintenance and operations, central administration, and transportation;

- resources for students at risk of academic failure including tutors, extended day, summer school, LEP programs, alternative schools, and special education; and
- staff compensation.

In each section, the study team provides an analysis of each element in the EB funding model in the context of current research.

Prototypical School District and Schools

The EB model 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. In other states, the EB model has used prototypical district and school sizes suggested by a review of the research literature. These prototypical sizes include a district with an enrollment of 3,900 students, elementary and middle schools of 450 students, and high schools of 600 students. The assumption is that the necessary resources for larger districts and schools can be extrapolated from these prototypes by increasing staff and non-staff resources proportionally to increased enrollment.

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 increased the size of the district and school prototypes to make them more representative of Maryland's districts. The prototypes used in Maryland consist of a district size of 12,000 students, elementary school size of 450 students, middle school size of 720 students, and high school size of 1,200 students. The following EB model recommendations are based on the original 3,900-student district size and corresponding school sizes. The changes to these recommendations resulting from using the larger district and school sizes recommended by Maryland educators are discussed in Section 4: EB Professional Judgment Panels.

Table 3.1 below provides a summary of all the recommendations suggested by the EB model. Section 6 shows how these recommendations are combined into a new base per pupil figure and three different pupil weights.

TABLE 3.1:
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 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: 33 ⅓ 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 in additional tutoring, extended day, summer school, LEP, and special education programs)
8. Core Guidance Counselors and Nurses	Kindergarten through grade five: One guidance counselor for every 450 students Grades six through 12: One guidance counselor for every 250 students Kindergarten to grade 12: One nurse for every 750 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 for the 450-student prototypical middle school One principal and one assistant principal for the 600-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	Current Evidence-Based Formula Ratio or Dollar per Pupil Figure
DOLLAR PER STUDENT RESOURCES	
13. Gifted and Talented	$40 per pupil inflated annually
14. Professional Development (PD)	10 days of student-free time for training built into teacher contract year $125 per pupil for trainers, inflated annually (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 Equipment	$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
21. Central Office Staffing	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.
RESOURCES FOR students at risk of academic failure	
22. Tutors	One tutor position for every 125 at risk students (in addition to the one core tutor position in each prototypical school); 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 3 ⅓ FTE 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)

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 3 ⅓ 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 and 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 non-public placements
29. Staff Compensation	Average of previous year For benefits: Retirement or pension costs: Certified staff: 4.56 percent Classified staff: 8.17 percent Health Insurance: $8,537 per employee Social Security and Medicare: 7.65 percent Workers' Compensation (certified): 0.55 percent Workers' Compensation (classified): 2.18 percent Unemployment Insurance: 2.8 percent

Response to Intervention

Before proceeding, the study team notes that the design of the EB model, which includes core and elective teachers for all children and provides additional resources for students at risk of academic failure, reflects the Response to Intervention (RTI) model. RTI is a three-tier approach to meet student needs. Tier 1 refers to core instruction for all students. The EB model seeks to make core instruction as effective as possible with its modest class sizes, provisions for collaborative time, and robust PD resources. Effective core instruction is the foundation on which all other educational strategies depend to effectively add value. Tier 1 usually includes some differentiated instruction in the regular classroom. After Tier 1 instruction, Tier 2 services are provided to students still struggling to achieve to standards before they are given an IEP and are labeled as a student with a disability. The EB model's current Tier 2 resources include one core tutor for every prototypical school and additional resources triggered by at risk student counts that provide funding for tutoring, extended day, summer school, and additional pupil support. Tier 3 includes all special education services.

Pupil Counts

In addition, the EB model typically recommends that states use an average daily membership (ADM) pupil count for the funding formula, which is similar to Maryland's use of the September 30 membership count. The EB approach recommends states use the greater of the previous year's ADM count or the previous three years' average. This approach recognizes the cost implications of both growing and declining enrollments. These pupil counts impact the formula for resource distribution, not the EB model's approach to determining the base per pupil number for the formula.

However, the current EB definition of at risk students is broader than only including students eligible for Free and Reduced-Price Meals (FRPM). Currently, the EB method defines at risk students as the unduplicated count of LEP students as well as FRPM-eligible students in grades in kindergarten to grade 12.[2] The intent of this augmented definition is to ensure all LEP students, whether or not they are also FRPM students, and all FRPM students trigger resources under the at risk pupil count and are counted only once for these resources.

Prototypical Schools and Districts

A key component of the EB model is the use of prototypical schools and districts to indicate the general level of resources in schools and districts, and to serve as a heuristic to calculate the base per pupil amount, and then the student weights. The EB model identifies resources for prototypical elementary, middle, and high schools, as well as a prototypical district. The model needs to use specific sizes for the prototypes to indicate the relative level of resources in the schools. Although the study's modeling is based on these prototypes, this does not imply Maryland should adopt new policies on school or district size based on the sizes used in the study. For the study team's school size recommendations, see the team's school size study final report.[3]

School sizes differ substantially within and across all states. No state has a specific policy on school size, though some, including New Jersey and Wyoming, use prototypical school sizes to develop and/or operate their funding formulas. A number of other states include "ideal" size configurations for different levels of schools in their facility guidelines – a process that clearly creates incentives for specific school sizes.

Much of the research on school size addresses the question of whether large schools – those significantly over 1,000 students – are more efficient and effective than smaller school units (schools of

[2] The study team is aware of the potential difficulties in obtaining a count of FRPM-eligible students due to changes in how districts may provide meals to students, such as the Community Eligibility Program (CEP). In this report, reference to FRPM students includes any changes the State may adopt to identify a more accurate count of such students.

[3] Humann, C., Palaich, R., Fermanich, M., and Griffin, S. (2015). Final School Size Study Report: Impact of Smaller Schools. Denver, CO: APA Consulting.

300 to 500), and whether cost savings and performance improvements can be identified by consolidating small schools or districts into larger entities. The research generally shows that school units of roughly 400 to 600 elementary students and between 500 and 1,000 secondary students may be as efficient as large schools while providing the necessary learning conditions for improving student outcomes, particularly for low-income and at risk students (Lee & Smith, 1997; Raywid, 1997, 1998; Ready & Lee, 2004).

Moreover, the research on small- and large-scale diseconomies, which should consider both costs and outcomes, generally does not provide solid evidence for a consolidation policy. In an earlier literature review, Fox (1981) concluded little research had analyzed output in combination with input and size variables. Ten years later, Monk (1990) assessed the meager extant research on costs and outcomes and concluded there was little support for either school or district consolidation.

In more recent reviews of scale economies and diseconomies and potential cost savings from consolidation, Andrews, Duncombe, & Yinger (2002) and Duncombe and Yinger (2007, 2010) found that the optimum size for elementary schools was in the 300- to 500-student range and for high schools was in the 600- to 900-student range. Both findings suggest that the very large urban districts and schools across the U.S. and Maryland are larger than the optimum size – and perhaps need to be downsized – and the potential cost savings from consolidation of small districts and schools are realistically scant. In sum, the research suggests elementary school units be in the range of 400 to 500 students and secondary school units be in the range of 500 to 1,000 students.

The EB approach starts by identifying resources for prototypical elementary, middle, and high schools with enrollments of 450, 450, and 600, respectively. It uses this approach and these prototypes to indicate the relative level of resources in schools, as well as to calculate a base per pupil cost. These prototypical school sizes reflect research on the most effective school sizes, although in reality few schools are exactly the size of the prototypes. However, because many schools in Maryland are larger than these prototypical school sizes, prototypical sizes of 450, 720, and 1,200 were used to determine a new base per pupil figure. Where actual school sizes are larger than those recommended here, the study team suggests that larger school buildings organize their students into smaller "schools within school" units inside the larger building.

Further, as discussed in Element 21 below, the EB model begins with a prototypical district size of 3,900, which comprises four 450-student elementary schools, two 450-student middle schools, and two 600-student high schools. This configuration is used to estimate a district-level cost per student. Several states have used the micro-EB formulas and ratios to estimate a base per pupil cost for their foundational school finance formula structure. States using this approach include Arkansas, New Jersey, and North Dakota. Maryland used a similar strategy by using the professional judgment (PJ) approach to identify the base per pupil figure for the Thornton Commission. Although actual school sizes vary in each of those states, the prototypes provide good estimates of a base cost per pupil in the context of each of those states. The study team's Wisconsin study (Odden et al., 2007) estimated a base per pupil cost

using prototypical schools and a prototypical district, then compared that to a district-specific figure created by adapting the ratios and formulas to every school and district size. In Wisconsin, the study team found that the difference between the two methods was about $50 per pupil, a small amount in a base spending level of approximately $10,000 per pupil. The EB prototypes should not be construed to imply Maryland replace all school sites with smaller or larger buildings or break school districts into smaller units. The prototypes are used as heuristics to determine the estimated base cost per student. Based on the four EBPJ panels' recommendations and the district's size analysis undertaken as part of the PJ adequacy approach, the study team expects to adjust the size of prototypical districts to more closely reflect the larger district sizes found in Maryland.

The EB model also makes adjustments for districts and schools with enrollments much smaller than the prototypes. These adjustments begin at about 1,000 students and provide additional resources per pupil on a sliding scale until enrollment reaches 97 or fewer students. All Maryland districts are larger than these figures, so the EB model's small district adjustments are not needed in Maryland.

Staffing for Core Programs

This section covers full-day kindergarten, core teachers, elective/specialist teachers, instructional facilitators/coaches, core tutors, core guidance counselors, core nurses (the latter three being changes and additions to the EB model), substitute teachers, supervisory aides, librarians, principals/assistant principals, and school secretaries.

1a. Prekindergarten

The table below shows the resources the EB model provides for full-day prekindergarten. Currently, Maryland provides prekindergarten services to four-year-olds from families with incomes up to 185 percent of the federal poverty level under the 2002 Bridge to Excellence in Public Schools Act, while the 2014 Prekindergarten Expansion Act provides additional slots for four-year-olds from families with incomes up to 300 percent of the federal poverty level.

Current Evidence-Based Recommendation
Each prekindergarten classroom is staffed at a class size of one teacher and one aide for every 15 students

Analysis and Evidence

There is growing evidence that a high-quality prekindergarten program is an effective way to help all children succeed in school (Kauerz, 2006). Such programs are best paired with well-resourced elementary schools, which can continue the performance catch-up that prekindergarten programs are designed to initiate. In addition, there is a growing recognition that integrating prekindergarten programs with the traditional public school system, particularly between kindergarten and grade three, could strengthen the effect of both prekindergarten programs and grades one to three. This

prekindergarten analysis will estimate the structure of a high-quality program for three- and/or four-year-olds integrated with high-quality kindergarten through grade three programs.

Much of the research on the effectiveness of prekindergarten through grade three programs has focused on the prekindergarten component, with less research on the advantages of integrated programs that continue from prekindergarten to grade three. Thus, the prekindergarten research is addressed first.

Drawing from a number of major studies that found long-term positive effects of prekindergarten programs on student learning, Reynolds and Temple (2008) constructed five possible pathways through which early childhood education programs produced their impacts, including:

- A cognitive advantage pathway leading to enhanced literacy, language, and numeracy skills and better school readiness (see Conger (2008) for evidence on early learning impacts on English language skills acquisition for LEP students);
- a family support pathway describing benefits from greater parental involvement in education and enhanced parenting skills (see Kalil & Crosnoe, 2008);
- a school support pathway for high-quality education programs beyond prekindergarten to strengthen the learning advantages of early childhood education programs (a pathway allowed by an overall adequate funding system);
- a social adjustment pathway suggesting benefits from increased classroom and peer social skills and positive teacher-child relationships; and
- a motivational pathway advocating that early education programs provide benefits to achievement motivation and commitment to school.

Whatever the pathway, most researchers find that high-quality prekindergarten, particularly for students from lower income backgrounds, significantly affects future student academic achievement as well as other desired social and community outcomes (Barnett, 2008, 2010, 2011a, 2011b; Camilli et al., 2010; Pianta et al., 2012; Reynolds et al., 2001, 2011; Reynolds and Temple, 2006, 2008; Schweinhart et al., 2005).[4] These longitudinal studies show that students from lower income backgrounds who experience a high-quality, full-day prekindergarten program perform better in learning basic skills in elementary school, score higher on academic goals in middle and high school, attend college at a greater rate, and earn higher incomes and engage in less socially-undesirable behavior as adults.

[4]A more extensive literature review, a comprehensive assessment of current prekindergarten capacity in Maryland, a return on investment analysis, and the study team's recommendations for prekindergarten programs in Maryland may be found in Workman, S., Palaich, R., & Wool, S. (2016). *A Comprehensive Analysis of Prekindergarten in Maryland*. Denver, CO: APA Consulting.

Lynch (2007), Heckman (2011), and a recent report from the Education Commission of the States (Workman, Griffith, & Atchison, 2014) identify specific positive impacts and multiple benefits of prekindergarten programs for children who participate in high-quality prekindergarten programs. Such children:

- Require less special education;
- are less likely to repeat a grade;
- are less likely to need child welfare services;
- enroll in K-12 education better prepared, which results in lower spending at that level;
- are less likely to engage in criminal activity as juveniles and adults;
- are less likely to need social welfare support services as adults;
- generally have higher incomes when they enter the labor force;
- pay higher taxes as a result of their higher incomes; and
- are likely to have employer-provided health insurance.

The consistently recurring theme in all analyses is the multiple benefits and long-term savings of high-quality prekindergarten programs. While typically a high-quality program is defined by the individuals employed to run the program and their commitment to their job, as well as a comprehensive array of services beyond just the "school" component, it is possible to identify the resource levels needed to support such high-quality programs.

Russo (2007) identified effective prekindergarten through grade three program components, including:

- Voluntary, full-day prekindergarten available to all three- and four-year-olds;
- full-day kindergarten that builds on prekindergarten experiences and is available to all children, which is supported by the current funding system;
- standards, curriculum, instruction, and assessments aligned within and across grades from prekindergarten through grade three, which can be accomplished with new curriculum standards;
- curriculum focused on emotional development, social skills, and self-discipline, as well as reading and mathematics;
- early education lead teachers qualified to teach any grade-level from prekindergarten through grade three and compensated based on public elementary school teacher salaries; and
- families and teachers who work together to ensure the success of all children.

More recently, the National Institute for Early Education Research (NIEER) has established 10 quality benchmarks to identify program quality.

Its 10 prekindergarten high-quality program standards are similar to the above and include:[5]

1. Comprehensive learning standards.
2. Teachers with a bachelor degree.
3. Teachers with specialized training in early childhood.
4. Assistant teachers with a Child Development Associate credential or the equivalent.
5. Teacher in-service training of at least 15-hours per year.
6. Maximum class sizes of 20.
7. Staff-to-child ratios of one-to-10 or better.
8. Vision, hearing, and health screening and referral and support services.
9. At least one meal per day provided.
10. Site visits to ensure program quality.

Nearly all of the longitudinal studies of prekindergarten programs have relied on data from three prekindergarten programs that meet the above standards: High-Scope Perry Preschool Program, Carolina Abecedarian Project, and Chicago Child-Parent Center Program. These results reinforce the finding that the most robust impacts of prekindergarten programs are found in studies of high-quality programs.

In sum, high-quality prekindergarten offered for a full day and taught by fully certified and trained teachers using a rigorous but appropriate early childhood curriculum can provide initial effects of 0.9 standard deviation that fall to 0.45 in later primary years. By themselves, prekindergarten programs can reduce by half achievement gaps linked to race and income. Effects of prekindergarten programs can be enhanced if followed by high-quality education programming in the elementary grades, particularly kindergarten through grade three.

Furthermore, there is increasing recognition that all students have access to prekindergarten. Research shows that this strategy produces significant gains for middle-income children and greater gains for low-

[5] See http://nieer.org/yearbook/compare/ for a detailed description of the NIEER quality standards.

income students (Barnett, Brown, & Shore, 2004). A prominent economist also supports this position (Greeley, 2014; Heckman, 2011).

Impact of Statewide Prekindergarten Programs

Researchers analyzed the success of more universal statewide prekindergarten initiatives. A 2003 study of state-funded prekindergarten programs in six states – California, Georgia, Illinois, Kentucky, New York, and Ohio – found that children from lower income families start catching up to their middle-income peers when they attend a prekindergarten program (Jacobson, 2003). There is evidence that statewide universal programs in Georgia (Henry et al., 2006) and Oklahoma (Gormley, Jr. et al., 2005) have improved the performance of students who participated in those programs. In addition, a 2007 study showed that prekindergarten programs in New Jersey's urban districts had not only significant short-term cognitive and social impacts, but also long-term, positive impacts on students who enrolled, closing the achievement gap by 40 percent in grade two for a two-year prekindergarten program (Frede, Jung, Barnett et al., 2007).

Fiscal Returns to Preschool

Generally, estimates of the long-term financial benefits of prekindergarten programs are reported as returns on investment. Reynolds and Temple (2008) reported that in addition to benefits on child well-being and student achievement, high-quality prekindergarten programs for low-income children at risk for underachievement produced economic returns ranging from $4 to $10 per dollar invested. Others make similar arguments (e.g. Heckman et al., 2010). Indeed, several studies conclude there is a return over time of $8 to $10 for every $1 invested in high-quality prekindergarten programs (Barnett, 2007; Barnett & Masse, 2007; Karoly et al., 1998; Reynolds et al., 2011; Zigler, Gilliam, & Jones, 2006; and Gormley, 2007).

In a more detailed analysis, Lynch (2007) found that voluntary, high-quality, publicly funded prekindergarten programs targeted to the poorest 25 percent of three- and four-year-olds generate substantial benefits that eclipse the costs of the programs in six years. By 2050, Lynch estimated the annual benefits of these prekindergarten programs would exceed the program costs in that year by a ratio of 12.1-to-one. He estimated the costs of a high-quality half-day program for these children at $6,300 (2006 dollars) for each of the two million children enrolled. He further estimated if individual states mainly funded those programs instead of the federal government, then by 2050 all 50 states would realize net benefits in tax revenues from the programs in four to 29 years.

Further, Lynch (2007) estimated if a voluntary, high-quality, publicly funded universal half-day prekindergarten program for three- and four-year-olds was established, budgetary savings would surpass costs in about nine years and, by 2050, benefits would exceed costs by an 8.2:1 ratio. He assumed these prekindergarten programs would cost about $6,300 per student and would enroll approximately seven million children when fully phased in. University of Chicago economist Heckman

(2015) goes beyond these assertions and argues investments in early childhood education potentially reduce deficits and improve the overall economy.

The Case for Integrated Prekindergarten through Grade Three Programs

The discussion above considered prekindergarten programs, but said little about prekindergarten through grade three programs or their benefits. While there is growing evidence that integrating prekindergarten programs with primary grades can lead to increased educational benefits, there has been less research in this field.

Takanishi and Kauerz (2008) argue that the prekindergarten through grade three years are the cornerstone of any educational system. They point out the importance of quality for integrated prekindergarten through grade three programs in providing strong foundations for lifelong learning, educational excellence, and competitiveness in the marketplace. Bogard (2003) suggests that variability in prekindergarten experiences is a strong predictor of children's outcomes, and the link is stronger for low-income children. Bogard suggests a prekindergarten through grade three approach to early childhood education will help "level the playing field" by supporting better teacher preparation and qualifications, as well as establishing sequential learning experiences from prekindergarten through grade three.

One of the challenges in thinking about prekindergarten through grade three programs is the need to coordinate traditional education programs in kindergarten through grade three with prekindergarten programs. This takes on a number of dimensions. First, even if the prekindergarten programs are in the same school, the need to coordinate education programs (curriculum, professional development (PD), teacher collaboration, school facilities) becomes more complex with the addition of more staff, more students, and more grade levels to integrate into the program. Second, many prekindergarten programs are offered by providers other than the public school system – frequently at sites other than the local school. This further complicates coordination efforts.

Finally, this is further complicated by prekindergarten programs remaining voluntary for the foreseeable future. Thus, some children will continue to come to kindergarten without the benefit of prekindergarten programs, and other children, who have had access to prekindergarten programs, will bring those benefits to the first years of formal schooling. In addition, prekindergarten through grade three program success depends on the educational program quality in kindergarten through grade three, which varies across schools, school districts, and states. This study addresses that issue by using an EB model to estimate the resources needed for a high-quality program in all prekindergarten through grade three classrooms.

Those who advocate for prekindergarten through grade three programs also support many of the components of success for high-quality prekindergarten programs. These include full-day programs with low pupil/teacher ratios staffed by highly qualified teachers and aides, along with support for

articulating curriculum, providing PD, fostering teacher collaboration, and helping children with special educational needs.

In earlier research, Picus, Odden, and Goetz (2009), as part of an overall effort to cost out prekindergarten through grade three programs in all states, developed case studies of several integrated prekindergarten programs. The case studied showed programs were provided in regular elementary school settings and often organized schools into prekindergarten and grade one, grade two and three, and grade four and five collegial teacher teams; provided prekindergarten teachers with the same pupil-free time as the grade-level elementary teachers so they could collaboratively plan during the regular school day; integrated the prekindergarten and grade one curriculum; and generally augmented a kindergarten through grade five elementary school with an additional one to three prekindergarten classrooms. Most of the prekindergarten classrooms staffed one teacher and one aide for every 15 to 20 students.

In addition, and as recommended by the NIEER standards, such programs had classroom teachers fully certified as early childhood educators and paid on the same salary schedule as the other teachers in the school and school system (see also Camilli et al., 2010; Whitebrook, 2004).

The Evidence-Based Method to Providing Prekindergarten Integrated Program

The EB method has been used to identify costs for integrated prekindergarten programs in three recent studies. The first was the major study Picus Odden & Associates (POA) conducted for The Fund for Child Development, which developed estimated costs for providing such programs in all states in the country using various assumptions of eligibility and participation (Picus, Odden & Goetz, 2009). The second was a study conducted in 2011 as part of an adequacy study for the State of Texas (Picus, Odden, Goetz, & Aportela, 2012). The third was an analysis conducted for Maine as part of a 2013 recalibration of its adequacy-oriented school funding system (Picus et al., 2013).

In these three studies, the EB elementary school model was used to develop a per prekindergarten pupil cost for a high-quality prekindergarten program. The per pupil cost figure was derived from a prototypical prekindergarten program of 150 students, which included 10 classrooms of 15 students each with the staffing and program elements identified in Table 3.2. These elements draw from the elements and ratios that the EB model provides for regular elementary schools. The major difference is that for all prekindergarten classes, the EB model provides one FTE teacher position and one FTE instructional aide position for every 15 prekindergarten students.

The prototypical prekindergarten school functions and includes resources similarly to the regular EB elementary school model with the exception that in the model described here, the school has only prekindergarten classrooms. The EB prekindergarten teachers trigger elective teachers and substitutes just as in a regular elementary school. Pupils also trigger instructional coaches, pupil support, secretaries, and all the per pupil dollar amounts – technology, instructional materials, PD, assessments – as for a regular elementary school. The model includes an assistant principal position to provide a

prekindergarten program coordinator, and also includes central office costs such as central administration and operation and maintenance. Further, the model includes putting prekindergarten teachers on the same salary schedule as teachers of other grades, as a way to ensure high-quality staff in the programs (Camilli et al., 2010; Whitebrook, 2004).

Table 3.2 summarizes the program elements of the EB prototypical prekindergarten program.

TABLE 3.2

ELEMENTS FOR AN EVIDENCE-BASED PROTOTYPICAL PREKINDERGARTEN PROGRAM

	Prekindergarten Prototype
Pupils	**150**
Personnel Resources	
Core Teachers	10.00
Elective Teachers	2.00
Instructional Facilitators	0.75
Pupil Support (e.g. Counselors, Family Outreach, Nurse)	1.50
Supervisory Aides	0.75
Instructional Aides	10.00
Substitute Teachers	0.64
Program Coordinator (in lieu of Principal/AP)	1.00
School Secretary	1.00
Dollar per Pupil Resources	
PD Resources	150
Technology/Equipment	150
Instructional Materials	150
Assessments	150

The data in the table can be used to identify a separate per prekindergarten pupil cost for the program.

On the other hand, Maryland's primary prekindergarten program is incorporated into the base foundation expenditure per pupil figure. The most straightforward way to follow this approach would be to add the prekindergarten student count to the prototypical elementary school, staff those classrooms at one teacher and one aide position for every 15 students, and let all of the other formulas work as currently designed. Such an approach would trigger all the resources in the model portrayed in Table 3.2 and would seamlessly integrate prekindergarten support into the State's funding model. If prekindergarten students were also at risk of underachievement, then they would trigger the resources for summer school and after-school programs, thus allowing for more of a year-round, full-service prekindergarten program.

1b. Full-Day Kindergarten

The table below shows that the EB model provides for full-day kindergarten. Since 2007-08, Maryland has supported full-day kindergarten for all five-year-olds.

Current Evidence-Based Recommendation
Full-day kindergarten program: Each kindergarten student counts as 1.0 pupil in the funding system

Analysis and Evidence

Research shows that full-day kindergarten, particularly for students from low-income backgrounds, has significant positive effects on student learning in the early elementary grades (Gullo, 2000; Slavin, Karweit & Wasik, 1994). Fusaro's (1997) meta-analysis of 23 studies comparing the achievement effect of full-day kindergarten to half-day kindergarten programs found an average effect size of +0.77,[6] which is substantial. Children participating in full-day kindergarten programs do better learning the basic skills of reading, writing, and mathematics in the primary grades than children who receive only a half-day program or no kindergarten at all (see also Lee, Burkam, Ready, Honigman, & Meisels, 2006).

In 2003, using nationally representative, longitudinal data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), Denton, West & Walston (2003) showed that children who attended full-day kindergarten had a greater ability to demonstrate reading knowledge and skill than their peers in half-day programs, across the range of family backgrounds. Cooper et al.'s (2010) comprehensive meta-analysis reached similar conclusions, finding the average effect size of students in full-day versus half-day kindergarten to be +0.25. Moreover, a randomized controlled trial, the gold standard of education research, found the effect of full-day versus half-day kindergarten to be about +0.75 standard deviation (Elicker & Mathur, 1997). As a result of this research, funding full-day kindergarten for five-year-olds, as well as prekindergarten for four-year-olds, is an increasingly common practice among the states (Kauerz, 2005).

Since research suggests that children from all backgrounds can benefit from full-day kindergarten programs, the EB model supports a full-day program for all students by counting such students as 1.0 in the state aid formula.

[6] Effect size is the amount of a standard deviation in higher performance that the program produces for students who participate in the program versus students who do not. An effect size of 1.0 indicates that the average student's performance would move from the 50th to the 83rd percentile. The research field generally recognizes effect sizes greater than 0.25 as significant and greater than 0.50 as substantial.

2. Elementary Core Teachers/Class Size

In staffing schools and classrooms, the most expensive decision superintendents and principals make is that of class size. Core teachers are defined as grade-level classroom teachers in elementary schools. In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies, and world language.

Current Evidence-Based Recommendation
Grades kindergarten through grade three: 15 Grades four and five: 25

Analysis and Evidence

The gold standard of educational research is randomized controlled trials, which provide scientific evidence on the impact of a certain treatment (Mosteller, 1995). Thus, the primary evidence on the impact of small classes today is the Tennessee STAR study, which was a large-scale, randomized controlled experiment of class sizes of approximately 15 compared to a control group of classes with approximately 24 students in kindergarten through grade three (Finn & Achilles, 1999; Word et al., 1990). The study found that students in the small classes achieved at a significantly higher level (effect size of about 0.25 standard deviation) than those in regular class sizes, and the impacts were even larger (effect size of about 0.50) for low-income and minority students (Finn, 2002; Grissmer, 1999; Krueger, 2002). The same research also showed that a regular class of 24 to 25 with a teacher and an instructional aide *did not* produce a discernible positive impact on student achievement, a finding that undercuts proposals and widespread practices that place instructional aides in elementary classrooms (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

Subsequent research showed the positive impacts of the small classes in the Tennessee study persisted into the middle and high school years, and the years beyond high school (Finn, Gerger, Achilles, & Zaharias, 2001; Konstantopulos & Chung, 2009; Krueger, 2002; Mishel & Rothstein, 2002; Nye, Hedges, & Konstantopulos, 2001a, 2001b). Longitudinal research on class size reduction also found that the lasting benefits of small classes include a reduction in the achievement gap in reading and mathematics in later grades (Krueger & Whitmore, 2001).

Although some argue that the impact of the small class sizes is derived primarily from just kindergarten and grade one, Konstantopoulos and Chung (2009) found that the longer students were in small classes, i.e. in kindergarten through grade three, the greater the impact on achievement in grades four through eight. They concluded that the full treatment – small classes in the first four grades – had the greatest short- and long-term impacts.

Though differences in analytical methods and conclusions characterize some of the debate over class size (see Hanushek, 2002; Krueger, 2002), the EB model reflects those concluding class size makes a

difference for class sizes of approximately 15 students with one teacher (and not class sizes of 30 with an aide or two teachers) and only for kindergarten through grade three.

Finally, as funds for schools become scarcer, it is legitimate to raise the issue of the cost of small classes versus the benefits. Whitehurst and Chingos (2010) argue that though the Tennessee STAR study supports the efficacy of small classes, there is other research today that has produced more ambiguous conclusions. However, they also note that this other research includes class size reductions in grades above kindergarten through grade three and "natural experiments" rather than randomized controlled trials. Most importantly, they also conclude that while the costs of small classes are high, the benefits, particularly the long-term benefits, outweigh the costs and small class sizes in kindergarten through grade three "pay their way."

The study team consistently recommends that states fund all other elements of the EB model before putting funds into the class size recommendations displayed above. The study team has made this recommendation because research shows many other components of the EB model are more cost effective in terms of improving student performance, particularly for improving the performance of students at risk of academic failure.

3. Secondary Core Teachers/Class Size

In middle and high schools, core teachers are those who teach core subjects such as mathematics, science, language arts, social studies, and world language. AP classes in these subjects are considered core classes. However, because Maryland policy requires students to take four years of math, regardless of what classes were taken in middle school, there is a need for additional teacher resources to provide for very small, highly advanced classes. This need sometimes arises in other subjects as well. Consequently, the EB model for Maryland provides one additional teacher for each prototypical high school, which provides enough resources to offer up to five of these very small classes.

Current Evidence-Based Recommendation
Grade six through 12: 25 (plus one additional teacher in prototypical high schools for advanced classes)

Analysis and Evidence

There is less research evidence on the most effective class size in grades four through 12 than there is on effective class size in kindergarten through grade three. As a result, in developing the EB model, the study team sought evidence on the most appropriate secondary class size from typical and best practices to identify the most appropriate class size for these grades. The national average class size in middle and high schools is roughly 25, and nearly all comprehensive school reform models were developed on the basis of a class size of 25 (Odden, 1997a; Stringfield, Ross, & Smith, 1996), a conclusion on class size reached by the dozens of experts who created these whole-school design

models. Although many professional judgment (PJ) panels[7] in many states have recommended secondary class sizes of 20, none cited research or best practices to support that proposal.

Citing more recent studies, Whitehurst and Chingos (2010) argue that there might be a modest linear relationship in improving student performance when class size drops from between 25 and 30 students to 15. The study team's view of the evidence and impact is that the gains identified are modest at best, and insufficient to alter the EB class size formulas. Both the elementary and secondary EB class size recommendations are within the general parameters of actual class sizes in Maryland (Maryland State Department of Education, 2013).

4. Elective/Specialist Teachers

In addition to core classroom teachers, the EB model provides additional elective/specialist teachers to support core teachers. This allows schools to offer a full liberal arts curriculum – core and electives – as well as time during the school day for teachers to collaborate on instructional planning, participate in PD activities, and otherwise plan for classroom instruction. Generally, non-core or elective teachers, also called specialist teachers, offer courses in subjects such as music, band, art, physical education (PE), health, and career-technical education (CTE).

Current Evidence-Based Recommendation
Elementary Schools: 20 percent of core elementary teachers Middle Schools: 20 percent of core middle school teachers High Schools: 33⅓ percent of core high school teachers

Analysis and Evidence

In addition to the core subjects addressed above, schools need to provide a solid, well-rounded curriculum including art, music, library skills, and physical education. Teachers also need some time during the regular school day to work collaboratively and engage in job-embedded PD. To provide every teacher one period a day for collaborative planning and focused PD requires an additional 20 percent allocation for elective teachers. Using this elective staff allocation, every teacher – core and elective – would teach five of six periods during the day and have one period for planning, preparation, and collaborative work. One of the most important elements of effective collaborative work is team-focused, data-based decision making using student data to improve instructional practices, now shown to be effective by a recent randomized controlled trial (Carlson, Borman, & Robinson, 2011).

[7] The professional judgment approach, another widely recognized method for estimating education adequacy, makes use of the recommendations of panels of expert PK-12 practitioners for estimating adequate education funding.

The 20 percent additional staff is adequate for elementary and middle schools, but the EB method developed a different argument for high schools. If the goal is to have more high school students take a core set of rigorous academic courses and learn the course material at a high level of thinking and problem solving, cognitive research findings suggest that use of longer class periods, such as a block schedule, is a better way to organize the instructional time of a high school. (Bransford, Brown, & Cocking, 1999; Donovan & Bransford, 2005a, 2005b, 2005c). Typical block scheduling for high schools includes four 90-minute blocks where teachers provide instruction for three of those 90-minute blocks and have one block (90 minutes) for planning, preparation, and collaboration each day. This schedule requires elective teachers at a rate of 33⅓ percent of the number of core teachers. This block schedule would operate with students taking four courses each semester while attending the same classes each day or with students taking eight courses each semester while attending different classes every other day. Such a schedule could also accommodate a few "skinny" blocks (45-minute periods) for some classes. Each of these specific ways of structuring a block schedule would require an additional 33⅓ percent of the number of core teachers to serve as elective teachers to provide the regular teacher with a block for planning, preparation, and collaboration each day.

This staffing recommendation for high schools would be sufficient to provide all students with a rigorous set of courses throughout grade nine through 12 and the 21 credits required for high school graduation in Maryland, as well as be ready for any university in the country.

The study team explicitly notes that the elective teacher recommendation described above does not provide sufficient resources, at the same class sizes, for either middle schools or high schools to offer a seven-period day and require teachers to instruct for only five of those periods. The EB model does not resource schools at that level for two primary reasons. First, the EB model formulates recommendations on strategies and resources that help to improve student performance in the core subjects of reading/English/language arts, mathematics, science, history/geography, and world language, in part by providing nearly an hour of instruction in each of these subjects daily. Restructuring the day to add a seventh period is usually accomplished by reducing the minutes of instruction in core subjects and thus is not a strategy likely to boost performance in those subjects, regardless of the arguments about the motivational aspects of elective classes. Second, increasing the provision of specialist and elective teachers to 40 percent in both middle and high schools is more costly. Therefore, a recommendation of 40 percent specialists and elective teachers in secondary schools would result in added costs and a potential decrease in instructional effectiveness for the core subjects, something not aligned with the framework for the EB approach to adequacy.

The above formulas for core and elective teachers are premised on the class size ratios specified: 15 for kindergarten through grade three and 25 for grade four through six. The formulas assume the elective class sizes are the same, and therefore produce a total of 31.2 teacher positions for a 450-student prototypical elementary school, 21.6 teacher positions for a 450-student prototypical middle school, and 32 for a prototypical 600-student high school. These class size and core and specialist teacher ratios can then be converted to a teacher-staffing ratio, a term used in other states. The teacher-student ratio

would be 14.42 for the prototypical elementary school, 20.83 for the prototypical middle school, and 18.75 for the prototypical high school. These teacher-staffing ratios are for *teaching* staff only. The EB model includes other staff, such as instructional coaches, guidance counselors, and nurses, which represent additional staff for each school.

5. Instructional Facilitators/Coaches

Coaches, or instructional facilitators, coordinate the instructional program, but most importantly provide the critical ongoing instructional coaching and mentoring that the PD literature shows is necessary for teachers to improve their instructional practice (Cornett & Knight, 2008; Crow, 2011; Garet, Porter, Desimone, Birman, & Yoon, 2001; Joyce & Calhoun, 1996; Joyce & Showers, 2002). This means that they spend the bulk of their time with teachers modeling lessons, giving feedback to teachers, working with teacher collaborative teams, and generally helping to improve the instructional program. The few instructional coaches who also function as school technology coordinators provide the technological expertise to fix small problems with the computer system, install software, connect computer equipment so it can be used for both instructional and management purposes, and provide PD to embed computer technologies into a school's curriculum. This report expands on the rationale for these individuals in the section on PD (Element 16), but includes them here as they represent teacher positions.

Current Evidence-Based Recommendation
1.0 FTE instructional coach position for every 200 students

Analysis and Evidence

Only a few states (Arkansas, New Jersey, Wyoming, and, to a modest degree, North Dakota) explicitly provide resources for school- and classroom-based instructional coaches, yet instructional coaches are key to making PD work (see Element 16 below). Most comprehensive school designs (see Odden, 1997; Stringfield, Ross, & Smith, 1996) and EB studies conducted in other states (Arizona, Arkansas, Kentucky, Maine, North Dakota, Texas, Washington, Wisconsin) call for school-based instructional facilitators or instructional coaches (sometimes called mentors, site coaches, curriculum specialists, or lead teachers).

Early research found strong effect sizes (1.25 to 2.71) for coaches as part of PD (Joyce & Calhoun, 1996; Joyce & Showers, 2002). A 2010 evaluation of a Florida program that provided reading coaches for middle schools found positive impacts on student performance in reading (Lockwood, McCombs & Marsh, 2010). A related study found that coaches provided as part of a data-based decision making initiative also improved both teachers' instructional practice and students' achievement (Marsh, McCombs, & Martorell, 2010).

More importantly, a recent randomized controlled trial of coaching (Pianta, Allen, & King, 2011) found significant positive impacts in the form of student achievement gains across four subject areas –

mathematics, science, history, and language arts. This gold standard of research provides further support to this element as an effective strategy to boost student learning.

In terms of numbers of coaches, several comprehensive school designs suggest that although one instructional coach might be sufficient for the first year of implementation of a school-wide program, in a school with about 500 students, additional instructional coaches are needed in subsequent years. Moreover, several technology-heavy school designs recommend a full-time facilitator who spends at least half time as the site's technology expert. Thus, drawing from all programs, the study team concludes that 1.0 FTE instructional coach/technology coordinator is needed for every 200 students in a school. This resourcing strategy works for elementary as well as middle and high schools.

Although instructional coaching positions are identified as FTE positions, schools could divide the responsibilities across several individual teachers. For example, the 3.0 FTE positions in a 600-student high school could be structured with six half-time teachers and instructional coaches. In this example, each teacher/coach would work 50 percent time as a coach – perhaps in one curriculum area such as reading, math, science, social studies, or technology – and 50 percent time as a classroom teacher or tutor.

This level of staffing for coaches, combined with the additional elements of PD discussed below, focus on making Tier 1 instruction (in the RTI frame) as effective as possible, providing a solid foundation of high-quality instruction for everyone, including students who struggle to learn to proficiency.

6. Core Tutors/Tier 2 Intervention

The most powerful and effective approach for helping students struggling to meet state standards is individual one-to-one or small group (one-to-three or one-to-five) tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). In earlier reports, the EB model allocated tutors to schools based on the number of at risk students. Reports since then recognize that all schools, even with those without at risk students, have some students at risk of academic failure and need some minimum Tier 2 resources. Thus, the EB model has been modified so that each prototypical school receives at least one tutor regardless of the number of at risk students. Consequently, this report identifies the tutor resources a school receives under the current EB model within the Core Staffing section and discusses the need for more tutors in Element 22 below.

Current Evidence-Based Recommendation
1.0 FTE tutor position in each prototypical school (Additional tutors are enabled through the at risk pupil count in Element 22)

Analysis and Evidence

Students who must work harder and need more assistance to achieve to proficiency levels especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by

the components of the approach used, e.g. the tutoring program's nature and structure. Effect sizes of tutoring programs on student learning reported in meta-analyses range from 0.4 to 2.5 (Cohen, Kulik, & Kulik, 1982; Shanahan, 1998; Shanahan & Barr, 1995; Wasik & Slavin, 1993) with an average of about 0.75 (Wasik & Slavin, 1993).

The impact of tutoring programs depends on how they are staffed and organized, the tutoring program's link to the core program, and tutoring intensity. Researchers (Cohen, Kulik & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) found greater effects when tutoring includes:

- Using professional teachers as tutors;
- initially providing one-to-one tutoring to students;
- using tutors trained in specific tutoring strategies;
- closely aligning tutoring to the regular curriculum and specific learning challenges, with appropriate content-specific scaffolding and modeling;
- allowing sufficient time for tutoring; and
- highly structuring programming, both substantively and organizationally.

Several specific structural features are associated with effective one-to-one tutoring programs:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is an intensive activity, individual teachers may spend only half their time tutoring, but a 1.0 FTE tutoring position would allow 18 students per day to receive one-to-one tutoring). Four positions would allow 72 students to receive individual tutoring daily in the prototypical elementary and middle schools;
- second, most students do not require tutoring all year long. Tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes such as these, nearly half the student body of a 400-student school unit could receive individual tutoring during the year; and
- third, not all students who are from low-income backgrounds require individual tutoring, so core tutors and a portion of the at risk tutor allocation could be used for students in the school who may not be from a lower income family but have a learning issue that could be remedied by tutoring. This also is part of the rationale for including one tutor in each prototypical school, regardless of the number of at risk students.

Though this discussion focuses on *individual* tutoring, schools could also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully.

One-to-one tutoring would be reserved for the students with the most severe reading difficulties, such as scoring at or below the 20th or 25th percentiles on a norm-referenced test or below basic level on state achievement tests. Intensive instruction for groups of three to five students would be provided for students above those levels but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help needs to be more explicit and sequenced than that for other students. Young children with weakness in knowledge of letters, letter sound relationships, and phonemic awareness need explicit and systematic instruction to help them first decode, then learn to read and comprehend. As Torgeson (2004:12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of high at risk children in kindergarten, first grade and second grade [.....] only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability … schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire word-reading skills at grade-level by the third grade …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text…. Finally, it requires not only direct practice to build fluency…. but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

Torgeson (2004) goes on to state that meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group and more than 30 students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though the EB model emphasizes one-to-one tutoring, and some students need one-to-one tutoring, other small group practices (which characterize the bulk of Tier 2 interventions) can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect is often smaller, as it is much more difficult to undo the lasting damage of not

learning to read, particularly when students with severe reading deficiencies enter middle and high schools. However, a new randomized control study (Cook et al., 2014), discussed below, found similarly positive impacts of a tutoring program for adolescents in high poverty schools *if* it was combined with counseling. This is possible with the EB model as it includes such additional non-academic pupil support resources (see Element 23 discussion).

Two recent randomized controlled trials of the effectiveness of tutoring for students at risk of academic failure strengthen the above rationale for tutors. These trials also support the study team's logic for providing a minimum level of tutor support in all schools and additional tutors for schools with more need. At the elementary-level, using a randomized controlled trial, May et al. (2013) assessed the impact of tutors in a Reading Recovery program. In the third year of a five-year evaluation, they found that Reading Recovery tutoring had an effect size of 0.68 on overall reading scores relative to the population of students eligible for such services in the specific study and a 0.47 effective size relative to the national population of grade one struggling readers. The effects were similarly large for reading words and reading comprehensive sub-scales.

For students in high schools, Cook et al. (2014) reported on a randomized controlled trial of a two-pronged intervention that provided disadvantaged youth with tutoring *and* counseling. They found that intensive individualized academic extra help (tutoring) combined with non-academic support seeking to teach grade nine and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy (CBT) led to improved math and reading performance. The study sample consisted mainly of students from low-income and minority backgrounds, which generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48. The combined program also appeared to increase high school graduation by 14 percentage points (a 40-percent hike). The authors concluded that this intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies.

These studies are highlighted for several reasons. First, they represent new, randomized controlled trials supporting the efficacy of tutoring. Second, they show that tutoring can work not only for elementary, but also for high school students (most of the tutoring research addresses only elementary-aged students). Third, they demonstrate that tutoring can work even in the most challenging educational environments. Fourth, they bolster the EB argument below that extra help resources in schools triggered by poverty/at risk status should also include some non-academic, counseling resources such as tutoring combined with counseling.

In earlier adequacy study reports, the study team recommended that at risk student counts determine tutor positions. The recommended ratio was one position for every 100 at risk students with a minimum of one for each prototypical school. As a result, a school without any at risk students would receive the minimum of one tutor position for students at risk of academic failure, and a school with 100 at risk students would receive the same tutoring or Tier 2 intervention resources, although it may have more need for such additional resources. Today, educators and policy makers across the country not only

argue that schools with few low-income students still have students who struggle to learn to proficiency, but also that the number of such students will likely increase with the more rigorous CCRS. The study team agreed with those arguments and modified the EB recommendations for tutoring resources.

The revised EB model provides one tutor/Tier 2 intervention position in each prototypical school. In conjunction with that change, the EB model adjusts the ratio for additional tutor positions to one position for every 125 at risk students. The additional support beyond the first tutor per prototypical school is discussed again in Element 22 below, students at risk of academic failure.

The new EB recommendation for tutor/Tier 2 intervention positions is more generous than the previous recommendation of one per 100 at risk students with a minimum of one for each prototypical school. In the above example, under the previous recommendation a prototypical school with no at risk students would receive one position, as would a prototypical school with 100 at risk students. The revised EB recommendation would provide 1.0 position to the school with no at risk students, but would provide 1.0 core tutor position for a school with 100 at risk students plus an additional 0.8 (100/125) position for the 100 at risk students for a total of 1.8 positions.

7. Substitute Teachers

Schools need some level of substitute teacher allocations to cover classrooms when teachers are sick short term, absent for other reasons, or on long-term sick or maternity leave. In many other states, substitute funds are budgeted at a rate of about 10 days for all teachers. The current EB model approach of providing funding equal to five percent of the cost of teacher salaries approximates that 10-day figure.

Current Evidence-Based Recommendation
Five percent of core and elective teachers, instructional coaches, tutors (and teacher positions in additional tutoring, extended day, summer school, LEP, and special education)

Analysis and Evidence

Five percent of a teacher work year equals approximately 10 days, so this provision provides up to 10 days of substitute teacher resources for each teacher. This approach does not mean that each teacher is provided 10 substitute days a year; it means the district receives a pot of money approximately equal to 10 substitute days per year for all teachers to cover classrooms when teachers are sick short term, absent for other reasons, or on long-term sick or maternity leave. This allocation is not for 10 days above what is currently provided; it simply is an amount of money for substitute teachers estimated at 10 days for each teacher on average. These substitute funds are not meant to provide for student-free days for PD. The PD recommendations are fully developed in a separate section below (Element 16).

8. Core Guidance Counselors and Nurses

The previous EB model provided student or pupil support resources without specifying guidance counselor or nurse positions. During the past five years that approach has been changed to provide guidance counselor and nurse positions in the core program and to provide additional pupil support positions (e.g. social workers and family liaison persons) based on at risk student counts as described in Element 23 below. Thus, core student support services now specify guidance counselor and nurse positions.

Current Evidence-Based Recommendation
1.0 FTE guidance counselor for every 450 kindergarten through grade five students 1.0 FTE guidance counselor for every 250 students, grades six through 12 1.0 FTE nurse for every 750 K-12 students (Additional student support resources are provided on the basis of at risk student counts in Element 23)

Analysis and Evidence

For guidance counselors, the EB model uses the standards from the American School Counselor Association (ASCA). Those standards recommend one counselor for every 250 secondary (middle and high school) students. This produces 1.8 pupil support positions for a 450-student prototypical middle school and 2.4 pupil support positions for a 600-student prototypical high school.

Today, many states require guidance counselors in elementary schools as well. Moreover, even in states that do not require counselors at the elementary level, a growing number of elementary schools have begun to employ these personnel. Consequently, the EB model has been modified in recent years to include a minimum of one guidance counselor for a prototypical elementary school. The EB model provides additional pupil support personnel to schools based on at risk student counts as described in Element 23 below.

These recommendations align with Maryland standards on guidance counselors. The Code of Maryland Regulations (COMAR) 13A.05.05.02 mandates a planned, systematic program of counseling, consulting, appraisal, information, and placement services for students in prekindergarten through grade 12. The program must be designed to address three goal areas: (1) personal and academic growth, (2) educational and career decision making, and (3) social/emotional growth and interpersonal relations. *However, COMAR does not mandate a ratio of students to counselors*. Generally, elementary schools have one certified school counselor, and middle and high schools have two to five certified school counselors, depending on the size of the school.

The physical and medical needs of students also have changed dramatically over the past several years. Many students need medications during the school day; often school staff members are required to administer such medications. Other students have additional medical or physical needs, and trends in several states show these needs have grown over the past decade. Thus, the EB model has been

enhanced to provide nurses as core positions. Drawing from the staffing standard of the National Association of School Nurses, the EB model now provides core school nurses at the rate of 1.0 FTE nurse position for every 750 students.

This approach also is in line with Maryland requirements. As the MSDE's website notes:

> Since 1991, the Code of Maryland Regulations COMAR 13A.05.05.05 - 15 has mandated health coverage in schools by a school health services professional. The school health services professional is defined in COMAR as a physician, certified nurse practitioner, or registered nurse, with experience and/or training in working with children or school health programs. Local school systems, with the assistance of local health departments, are responsible for providing school health services to all public schools. *The regulations do not specify a ratio of school nurse to student* (emphasis added).

Local jurisdictions in Maryland meet the mandate in a variety of ways. Some have a registered nurse in every school; others employ licensed practical nurses or registered nurses in each school. In some schools, trained unlicensed health staff members are working under the supervision of a registered nurse who may be responsible for one to three schools. Either local school systems or local health departments manage school health services programs. School nurses work with students, families, health care providers, and school staff to support student success.

9. Supervisory Aides

Supervisory aides are non-certified individuals who provide needed services and supervision necessary to a school such as lunch duty, hallway and external door monitoring, and helping elementary students get on and off buses. Supervisory aides do not provide assistance to teachers inside or outside the classroom or instruction of any kind to students.

Current Evidence-Based Recommendation
One supervisory aide for every 225 elementary and middle school students; and one supervisory aide for every 200 high school students

Analysis and Evidence

Elementary, middle, and high schools require staff for responsibilities that include lunch duty, before and after-school playground supervision, sometimes bus duty, and other responsibilities that do not require a licensed teacher. Covering these duties generally requires an allocation of supervisory aides at about the rate of 2.0 FTE aide positions for a school of 450 students.

However, research does not support the use of instructional aides for improving student performance. As noted in Element 2, the Tennessee STAR study (which produced solid evidence through field-based randomized controlled trials that small classes work in elementary schools) produced evidence that instructional aides in a regular-sized classroom do not add instructional value, i.e. do not positively impact student achievement (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001).

At the same time, districts may want to consider a possible use of instructional aides, as supported by research. Two studies have shown how instructional aides could be used to tutor students. Farkas (1998) has shown that if aides are selected according to clear and rigorous literacy criteria, are trained in a specific reading tutoring program, provide individual tutoring to students in reading, and are supervised, then they can have a significant impact on student reading attainment. Some districts have used Farkas-type tutors for students struggling in reading in the upper elementary grades. Another study by Miller (2003) showed that such aides could also have an impact on reading achievement if used to provide individual tutoring to students at risk of academic failure in grade one.

Neither study supports the typical use of instructional aides as general teacher helpers. Evidence shows that instructional aides can have an impact, but only if they are selected according to educational criteria, trained in a specific tutoring program, deployed to provide tutoring to students at risk of academic failure, and closely supervised.

10. Library Media Specialists

Most schools have a library, and staff resources must be sufficient to operate it and incorporate appropriate technologies into the library system.

Current Evidence-Based Recommendation
One library media specialist position for every 450 elementary and middle school students, and for every 600 high school students

Analysis and Evidence

There is scant research on the impact of school librarians on student achievement. In 2003, six states conducted studies of the impacts of librarians on student achievement: Florida, Minnesota, Michigan, Missouri, New Mexico, and North Carolina. In 2012, Colorado also conducted a statewide study using data from 2005-11. The general finding is, regardless of family income, children with access to endorsed librarians working full time perform better on state reading assessments (Rodney, Lance, & Hamilton-Rennell, 2003; Lance & Hofschire, 2012). The Michigan study found that regardless of whether the librarian was endorsed, student achievement was better for low-income children, but higher achievement was associated with having an endorsed librarian rather than an unendorsed librarian (Rodney, Lance, & Hamilton-Rennell, 2003). Each state examined the issue differently, but library staffing and the number of operating hours were generally associated with higher academic outcomes. The EB model recommendation for library staff is derived from best practices in other states, state statutes, and the referenced research.

This recommendation aligns with standards for library programs for Maryland schools.

11. Principals and Assistant Principals

Every school unit needs a principal. There is no research evidence on the performance of schools with or without a principal. All comprehensive school designs and all prototypical school designs from all PJ studies around the country include a principal for every school unit.

Current Evidence-Based Recommendation
1.0 FTE principal for the 450-student prototypical elementary school 1.0 FTE principal for the 450-student prototypical middle school 1.0 FTE principal and 1.0 FTE assistant principal for the 600-student prototypical high school

Analysis and Evidence

Few, if any, comprehensive school designs for 500 students include assistant principal positions. Very few school systems around the country provide assistant principals to schools with 500 or fewer students. The EB model recommends that instead of one school with a large number of students, school buildings with large numbers of students be subdivided into multiple school units within the building, with each unit having a principal. This implies that one principal would be required for each school unit. The EB model provides one assistant principal for the prototypical high school, largely for discipline and athletics.

12. School Site Secretarial Staff

Every school site needs secretarial support to provide clerical and administrative support to administrators and teachers, answer phones, greet parents when they visit the school, and help with paperwork.

Current Evidence-Based Recommendation
One secretary position for every 225 elementary and middle school students, and for every 200 high school students

Analysis and Evidence

The secretarial ratios included in the EB model generally are derived from common practices across the country. There is no research on the impact of clerical staff on student outcomes, yet it is impossible to have a school operate without adequate clerical staff support.

Dollar per Student Resources

This section addresses areas that are resourced by dollar per student amounts, including gifted and talented, PD, computers and other technology, instructional materials and supplies, and extra duty/student activities.

13. Gifted and Talented Students

A complete analysis of educational adequacy should consider the needs of gifted and talented students, most of whom perform above state proficiency standards. This is important for all states whose citizens desire improved performance for students at all levels of achievement.

Current Evidence-Based Recommendation
$40 per average daily membership (ADM) inflated annually

Analysis and Evidence

Research shows that developing the potential of gifted and talented students requires:

- Effort to discover the hidden talent of low-income and/or culturally diverse students;
- curriculum materials designed specifically to meet the needs of talented learners;
- acceleration of the curriculum; and
- special training in how teachers can work effectively with talented learners.

Discovering Hidden Talents in Low-Income and/or Culturally Diverse High Ability Learners

Research on the use of performance assessments, non-verbal measures, open-ended tasks, extended try-out and transitional periods, and inclusive definitions and policies show that these produce increased and more equitable identification practices for culturally diverse and/or low-income high ability learners. Access to specialized services for talented learners in the elementary years is especially important for increased achievement among vulnerable students. For example, culturally diverse high ability learners who participated in three or more years of specialized elementary and/or middle school programming had higher achievement at high school graduation, as well as other measures of school achievement, than a comparable group of high ability students who did not participate (Struck, 2003).

Access to Curriculum

Overall, research shows that curriculum programs specifically designed for talented learners produce greater learning than regular academic programs. Increased complexity of the curricular material is a key factor (Robinson & Clinkenbeard, 1998). Large-scale curriculum projects in science and mathematics in the 1960s, such as the Biological Sciences Curriculum Study (BCSC), the Physical Science Study Committee (PSSC), and the Chemical Bond Approach (CBA), benefited academically talented learners (Gallagher, 2002). Further, curriculum projects in the 1990s designed to increase the achievement of talented learners in core content areas such as language arts, science, and social studies produced academic gains in persuasive writing and literary analysis (VanTassel-Baska, Johnson, Hughes & Boyce, 1996; VanTassell-Baska, Zuo, Avery, & Little, 2002), scientific understanding of variables (VanTassel-

Baska, Bass, Ries, Poland, & Avery, 1998), and problem generation and social studies content acquisition (Gallagher & Stepien, 1996; Gallagher, Stepien, & Rosenthal, 1992).

Access to Acceleration

Because academically talented students learn quickly, one effective option for serving them is accelerated curriculum. Many educators and members of the general public believe acceleration always means skipping a grade. However, there are at least 17 different types of acceleration ranging from curriculum compacting (which reduces the amount of time students spend on material) to subject matter acceleration (going to a higher grade-level for one class) to high school course options like AP or concurrent credit (Southern, Jones, & Stanley, 1993). In some cases, acceleration means *content* acceleration, which brings more complex material to the student at his or her current grade-level. In other cases, acceleration means *student* acceleration, which brings the student to the material by shifting placement. Reviews of the research on different forms of acceleration have been conducted across several decades and consistently report the positive effects of acceleration on student achievement (Gallagher, 1996; Kulik & Kulik, 1984; Southern, Jones, & Stanley, 1993), including that of AP classes (Bleske-Rechek, Lubinski, & Benbow, 2004). Multiple studies also report participant satisfaction with acceleration and benign effects on social and psychological development.

Access to Trained Teachers

Research and teacher reports indicate that general classroom teachers make very few, if any, modifications for academically talented learners (Archambault et al., 1993), even though talented students have mastered 40 to 50 percent of the elementary curriculum before the school year begins. In contrast, teachers who receive appropriate training are more likely to provide classroom instruction that meets the needs of talented learners. Students report differences among teachers who have had such training, and independent observers in the classroom document the benefit of this training as well (Hansen & Feldhusen, 1994). Curriculum and instructional adaptation requires the support of a specially trained coach at the building level, which could be embedded in the instructional coaches recommended above (Reis & Purcell, 1993). Overall, learning outcomes for high-ability learners are increased when they have access to programs whose staff have specialized training in working with high-ability learners. This could be accomplished with the PD resources recommended below.

Overall, research on gifted programs indicates that the effects on student achievement vary by the strategy of the intervention. Enriched classes for gifted and talented students produce effect sizes of about +0.40 and accelerated classes for gifted and talented students produce somewhat larger effect sizes of +0.90 (Gallagher, 1996; Kulik & Kulik, 1984; Kulik & Kulik, 1992).

Practice Implications

At the elementary and middle school levels, the study team's understanding of the research on best practices is to place gifted students in special classes comprising all gifted students and accelerate their

instruction, because such students can learn much more in a given time period than other students. When the pull-out and acceleration approach is not possible, an alternative is to have these students skip grades to expose them to accelerated instruction. Research shows that neither of these practices systemically produces social adjustment problems. Many gifted students get bored and restless in classrooms that do not have accelerated instruction. Moreover, both of these strategies have little or no cost except for scheduling and training of teachers, resources that are provided for by PD (Element 14).

The primary approach to serving gifted students in high schools is to enroll them in advanced courses, such as AP and International Baccalaureate (IB), to participate in dual enrollment in postsecondary institutions or to have them take courses through distance learning mechanisms.

The study team confirmed its understanding of best practices for the gifted and talented with directors of three gifted and talented research centers in the United States: Dr. Elissa Brown, Director of the Center for Gifted Education, College of William & Mary; Dr. Joseph Renzulli, The National Research Center on the Gifted and Talented at the University of Connecticut; and Dr. Ann Robinson, Director of the Center for Gifted Education at the University of Arkansas at Little Rock.

The University of Connecticut center agreed with these conclusions and has developed a very powerful Internet-based platform – Renzulli Learning, which could provide an array of programs and services for gifted and talented students. This system takes students through a 25- to 30-minute detailed assessment of their interests and abilities, producing an individual profile for each student. The student is then directed, via a search engine, to 14 different Internet data systems including interactive websites and simulations that provide a wide range of opportunities to engage the student's interests. Renzulli stated that such an approach was undoubtedly the future for the very bright student and could be supported by a grant of $30 per student in a district. Field (2007) found that after 16 weeks, students given access to an Internet-based program, such as Renzulli Learning, to read, research, investigate, and produce materials significantly improved their overall achievement in reading comprehension, reading fluency, and social studies.

Since this research, Renzulli Learning was sold to Compass Learning, an educational organization with technology-based applications used around the country. Compass Learning has renamed the Renzulli Learning program GoQuest. According to the company's website,[8] a student's first experience with Renzulli Learning is with the Renzulli Profiler, a detailed online questionnaire that allows the Renzulli software to generate a personal profile of each student's top interests, learning styles, and expression styles, making it easier for teachers to get to know their students and effectively differentiate instruction. Once students and teachers generate a profile, they can use it to guide their exploration of the 40,000 online educational resources in the Renzulli database. Students can engage in self-directed

[8] http://www.renzullilearning.com/whatisrenzullilearning.aspx

learning by exploring safe, fully vetted resources specifically matched to their individual profiles. Further, teachers can browse the database of resources to find activities that align to specific objectives, skills, and state and Common Core curriculum standards.

On July 20, 2015, the study team spoke with Troy Duffield, a Compass Learning lead consultant who works with various states. He described the attributes of Renzulli Learning and other products provided by Compass Learning. In that conversation, the study team confirmed a new pricing structure for Renzulli Learning. The cost today is $40 per student for up to 125 students in a school, at which point the cost is $5,000 for a school and all students have full access to the program. If a figure of $40 per pupil were included in the EB model, all districts would be able to afford this gifted program.

14. Intensive Professional Development

PD includes a number of important components. This section describes the specific dollar resource recommendations the EB model provides for PD. In addition to the resources listed here, PD includes the instructional coaches described in Element 7 and the collaborative planning time provided by the provisions for elective or specialist teachers in Element 4.

Those staff positions are critical to an adequate PD program along with the resources identified in this section.

Current Evidence-Based Recommendation
10 days of student-free time for training built into teacher contract year $125 per ADM for trainers inflated annually (In addition, PD resources include instructional coaches [Element 5] and time for collaborative work [Element 4])

Analysis and Evidence

Effective teachers are the most influential factor in student learning (Rowan, Correnti, & Miller, 2002; Wright, Horn, & Sanders, 1997) and more systemic deployment of effective instruction is key to improving student learning and reducing achievement gaps (Odden, 2011a; Raudenbusch, 2009). All school faculties need ongoing PD. Improving teacher effectiveness through high-quality PD is arguably one of the most important strategies.

A comprehensive, and systemic PD strategy is the way in which all resources recommended in this report are transformed into high-quality, Tier 1 instruction that increases student learning. Though the key focus of PD is better instruction in the core subjects of mathematics, reading/language arts, writing, history, and science, the PD resources in the EB model are adequate to address the instructional needs for gifted and talented, special education, LEP students; to embed technology into the curriculum; and to provide elective teachers. Finally, all beginning teachers need intensive PD – first in classroom management, organization, and student discipline, then in instruction. Finally, the most effective way to

"induct" and "mentor" new teachers is to have them work in functional collaborative teacher teams, discussed above for Elements 4 and 5.

Fortunately, there is recent and substantial research on effective PD and its costs (e.g. Crow, 2011; Odden, 2011b). Effective PD is defined as PD that produces change in teachers' classroom-based instructional practice that can be linked to improvements in student learning. The practices and principles that researchers and PD organizations use to characterize "high-quality" or "effective" PD draw upon a series of empirical research studies that linked program strategies to changes in teachers' instructional practice and subsequent increases in student achievement. These studies, combined with recent reports from Learning Forward (the national organization focused on PD (see Crow, 2011), identified six structural features of effective PD:

1. The *form* of the activity, i.e. organizing the activity as a study group, teacher network, mentoring collaborative, committee, or curriculum development group. The above research suggests that effective PD should be school-based, job-embedded, and curriculum-focused rather than a one-day workshop.

2. The *duration* of the activity, including the total number of contact hours expected for participants to spend in the activity, as well as the span of time the activity takes place. The above research has shown the importance of continuous, ongoing, long-term PD that totals a substantial number of hours each year: at least 100-hours and close to 200-hours.

3. The degree to which the activity emphasizes *collective participation* from teachers in the same school, department, or grade-level. The above research suggests that effective PD be organized around groups of teachers from a school that over time includes the entire faculty.

4. The degree to which the activity is *content focused*, i.e. the degree to which the activity focuses on improving and deepening teachers' content knowledge and how students learn that content. The above research concludes that teachers need solid understanding of the content they teach, must be in tune with common student miscues or problems typically encountered while learning that content, and should have effective instructional strategies linking the two. The content focus today should emphasize content for college and career-ready curriculum standards.

5. The extent to which the activity offers opportunities for *active learning*, such as opportunities for teachers to become engaged in meaningful analysis of teaching and learning. For example, by scoring student work or developing, refining, and implementing a standards-based curriculum unit. The above research has shown that PD is most effective when it includes opportunities for teachers to work directly on incorporating the new techniques into their instructional practice with the help of instructional coaches (see also Joyce & Showers, 2002).

6. The degree to which the activity promotes *coherence* in teachers' PD by aligning PD to other key parts of the education system, such as student content and performance standards, teacher evaluation, school and district goals, and development of a professional community. The above research supports tying PD to a comprehensive, interrelated change process focused on improving student learning.

Form, duration, and active learning together imply that effective PD includes some initial learning (e.g. a two-week, 10-day summer training institute) as well as considerable longer term work in which teachers incorporate the new methodologies into their actual classroom practice, with guidance provided by instructional coaches. Active learning implies some degree of collaborative work and coaching during regular school hours to help the teacher incorporate new strategies into his/her normal instructional practices. It should be clear that the greater the duration of the initial training as well as coaching, the more time is required of teachers as well as PD trainers and coaches.

Content focus means that effective PD focuses largely on subject matter knowledge, how students learn that subject, and the actual curriculum used to teach the content. Today, this means a curriculum program to ensure students are college and career-ready when they graduate from high school. Collective participation implies that PD includes groups of and, at some point, all teachers in a school who then work together to implement the new strategies, engage in data-based decision making (Carlson, Borman, & Robinson, 2011), and build a professional community.

Coherence suggests that the PD is more effective when the signals from the policy environment (federal, state, district, and school) reinforce rather than contradict one another or send multiple, confusing messages. Coherence also implies that PD opportunities should be given as part of implementation of new curriculum and instructional approaches, e.g. the adoption of the Common Core curriculum. There is little support in this research for the development of individually oriented PD plans. The research implies a much more systemic approach.

Each of these six structural features has cost implications. Form, duration, collective participation, and active learning require various amounts of both teacher and trainer/coach/mentor time, during the regular school day and year and, depending on the specific strategies, outside of the regular day and year. This time costs money. Further, all PD strategies require some amount of administration, materials and supplies, and miscellaneous financial support for travel and fees. Both the above programmatic features and the specifics of their cost implications are helpful to describe the resource needs of specific PD programs.

From this research on the features of effective PD, the EB model includes the following for a systemic, ongoing, comprehensive PD program:

- Ten days of student-free time for training via an extension of the teacher work year; and
- funds for training at the rate of $125 per student.

These resources are in addition to:

- Instructional coaches (Element 5); and
- collaborative work with teachers in their schools during planning and collaborative time periods (Elements 4).

These resources and PD elements are fully aligned with Maryland's PD standards.

15. Instructional Materials

The need for up-to-date instructional materials is paramount. Newer materials contain more accurate information and incorporate the most contemporary pedagogical approaches. New curriculum materials are critical today as school systems shift to more rigorous CCRS. To ensure that materials are current, 20 states have instituted adoption cycles in which they specify or recommend texts that are aligned to state learning standards (Ravitch, 2004). Up-to-date instructional materials are expensive, but vital to the learning process. Researchers estimate that classroom textbooks and textbook content drive up to 90 percent of activities (Ravitch, 2004). Adoption cycles with state funding attached allow districts to upgrade their texts on an ongoing basis instead of allowing these expenditures to be postponed indefinitely.

Current Evidence-Based Recommendation
$190 per pupil for instructional and library materials

Analysis and Evidence

The type and cost of textbooks and other instructional materials differ across elementary, middle school, and high school levels. Textbooks are more complex and thus more expensive at the upper grades, whereas elementary grades use more workbooks, worksheets, and other consumables than the upper grades. Both elementary and upper grades require extensive pedagogical aides such as math manipulatives and science supplies that help teachers demonstrate or present concepts using different pedagogical approaches. As school budgets for instructional supplies have tightened in the past, consumables and pedagogical aides have typically been the first items to be cut, as teachers have been forced to manage without these supplies or to purchase materials out of their own pockets.

The price of textbooks ranges widely. In reviewing the price of adopted materials from a variety of sources, the top end of the high school price band is significant at $120 per book. Though the cost of textbooks has remained relatively constant over the past several years, many textbook companies have begun to offer electronic versions of their textbooks. Many of these electronic versions are offered in a time-bound contract somewhat similar to library resource contracts for content databases. Although the common hope has been that electronic textbooks would be priced at significantly lower levels than the paper-based texts, thus far that has not been the case. Most electronically based materials from standard publishers are the same price or are only marginally discounted by 10 to 20 percent.

Moreover, many publishers offer to sell the paper-based texts with the electronic version for a 20 percent to 30 percent premium; that electronic version is also time-bound. Further, until schools have reached a one-to-one student-to-computer ratio, it is not practical to rely on an exclusively electronic-based textbook.

A total average figure of $135 per student provides sufficient funds for adequate instructional materials and texts for most non-severe special education students. Modifications for severe special education cases would need to be funded from special education funds.

Adoption Cycle

While Maryland does not have a formal textbook adoption cycle, the EB model for instructional materials is developed based on a six-year adoption cycle. The six-year adoption cycle fits nicely with the typical secondary schedule of six content courses (see Table 3.3). It also comes close to matching the content areas covered at the elementary level.

TABLE 3.3

POTENTIAL SECONDARY SIX-YEAR ADOPTION CYCLE

Year	2014	2015	2016	2017	2018	2019
Content Area	Social Studies	Science Health PE	Fine Arts	English Language Arts	Foreign Language	Mathematics

In some years, at the elementary level there are subject areas that pertain more to the secondary levels. In these years, the funds for instructional materials provide the opportunity for purchasing not only additional supplementary texts but also consumables/pedagogical aides (see Table 3.4).

TABLE 3.4

POTENTIAL ELEMENTARY SIX-YEAR ADOPTION CYCLE

Year	2014	2015	2016	2017	2018	2019
Content Area	Language Arts	Mathematics	Social Studies	Science/ Health	PE, Visual and Performing Arts	Supplements, Consumables, Manipulatives

Library Funds

The National Center for Educational Statistics (NCES) reports that the average national per student expenditure for library materials in the 2010-11 school year was $16 (excluding library salaries) (NCES, 2013). Over 90 percent of the $16 was spent on book titles and only 10 percent on other resources such as subscription databases. This is a change from the 40 percent that was spent on book titles and 60 percent on other resources in 2005 reported by Michie and Holton (2005), demonstrating a possible shift back to printed materials. Though there seems to have been a reallocation of library materials between printed materials and other resources such as electronic databases, the amount per student

has remained unchanged for many years despite inflationary factors. The NCES figures are based on self-reported responses to NCES surveys.

Over the last 10 years, libraries have purchased subscriptions or used electronic databases such as online catalogs, the Internet, reference and bibliography databases, general article and news databases, college and career databases, academic subject databases, and full electronic textbooks. In 2002, 25 percent of school libraries across the nation had no subscriptions, 44 percent had one to three subscriptions to electronic databases, 14 percent had four to seven subscriptions, and 17 percent had subscriptions to seven or more. Usually larger high schools subscribed to the most services (Scott, 2004). Based on the reallocation of spending back to book titles, the move to electronic databases appears to have slowed and/or even decreased. This could be due to various factors such as the rise in free services and online resources such as the Khan Academy and Wikipedia.

Electronic database services vary in price and scope and usually are charged to school districts on an annual per student basis. Depending on the content of these databases, costs can range from $1 to $5 per database per year per student.

Inflating these numbers to adequately meet the needs of school libraries, the EB model includes funding of $25 per student to pay for library texts and electronic services. This figure modestly exceeds the national average, allowing librarians to strengthen print collections. At the same time, it allows schools to provide and experiment with the electronic database resources on which more and more students rely (Tenopir, 2003).

This brings the overall average total funding for instructional materials and library resources to $160 per pupil.

Move to Common Core

Maryland fully implemented the Common Core standards for the 2013-14 school year. Access to standards-aligned instructional resources for teachers and students is critical for the successful implementation of these standards. Because of the move to Common Core, the current EB recommendation is to add an additional $30 to the $160 for a total of $190 per pupil. These additional funds would allow districts in some cases to purchase textbooks with rights to the electronic copies and permit the purchase of supplementary materials that support Common Core learning goals.

16. Short Cycle/Interim Assessments

The need to monitor the progress of students with IEPs, benchmark students' progress over the year, and engage teachers in collaborative work using student data requires that faculties have access to short cycle, interim assessment data.

Current Evidence-Based Recommendation
$25 per pupil for short cycle, interim assessments

Analysis and Evidence

Data-based decision making has become an important element in school reform over the past decade. It began with the seminal work of Black and William (1998) on how ongoing data on student performance could be used by teachers to frame and reform instructional practice, and continued with current best practice on how professional learning communities use student data to improve teaching and learning (DuFour et al., 2010; Steiny, 2009). The goal is to have teachers use data to inform their instructional practice, identify students who need interventions, and improve student performance (Boudett, City, & Murnane, 2007). As a result, data-based decision making has become a central element of schools that are moving the student achievement needle (Odden, 2009, 2012).

Recent research on data-based decision making has documented significant positive impacts on student learning. For example, Marsh, McCombs, and Martorell (2010) showed how data-driven decision making in combination with instructional coaches produced improvements in teaching practice as well as student achievement. Further, a recent study of such efforts using the gold standard of research (a randomized controlled trial) showed that engaging in data-based decision making using interim assessment data improved student achievement in both mathematics and reading (Carlson, Borman, & Robinson, 2011).

There is some confusion in terminology when referring to these assessment data. Generally, these student performance data are different from those provided by state accountability or summative testing, such as Maryland's end-of-year tests. The most generic term is "interim data," meaning assessment data collected in the interim between the annual administrations of state accountability tests, though some practitioners and writers refer to such data as "formative assessments." There are several kinds of such "interim" assessment data. Benchmark assessments, such as those provided by the Northwest Evaluation System called MAP (www.nwea.org), are given two to three times a year, often at the beginning, middle, and end of the year. They provide benchmark information so teachers can see at the end of the semester how students are progressing in their learning. Sometimes these benchmark assessments are given only twice, once in the fall and once in late spring, and function as a pre- and post-test for the school year, even though some practitioners erroneously refer to tests used this way as "formative assessments." These test data cannot be used for progress monitoring in an RTI program of extra help for students at risk of academic failure.

A second type of assessment data is collected during shorter time cycles within every quarter, such as monthly, and often is referred to as a "short cycle" or "formative" assessment. These more "micro" student outcome data are meant to be used by teachers to plan instructional strategies before a curriculum unit is taught, track student performance for the two to three curriculum concepts that

would normally be taught during a nine-week or so instructional period, and monitor progress of students with IEPs.

Examples of "short cycle" assessments include STAR Enterprise from Renaissance Learning (www.renaissance.com), an online, adaptive system that provides data in reading/literacy and mathematics for prekindergarten through grade 12. The basic package costs less than $10 per student per subject, takes students 20- to -30 minutes to complete, aligns to Common Core, can be augmented with PD activities, and can be given as often as the teacher wishes at no extra cost. Many Reading First schools as well as many schools the study team has studied (Odden & Archibald, 2009; Odden, 2009) use the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) assessments (http://dibels.uoregon.edu).

The Wireless Generation, now one of three parts of Amplify that was launched in July 2012 as an education division of News Corp, has created an assessment similar to DIBELS that can be used with a handheld, mobile electronic device. The company also offers a web service that provides PD for teachers on how to turn the results into specific instructional strategies, including video clips of how to teach certain reading skills. The cost is approximately $15 per student per year, plus approximately $200 per teacher for the device, and somewhat more for training, though the company usually uses a trainer-of-trainers approach.

Many districts have also developed their own benchmark tests mainly in core subject areas. Others use common unit or section tests to gauge interim student progress toward achieving standards. While these tests cannot be normed because of their localized origin, they can provide valuable information to site and district teachers and administrators to ensure students are learning and teachers have covered the subject standards required in district pacing guides.

Though some interim assessments are teacher created, it often is more efficient to start with commercially available packages, most of which are administered online and provide immediate results. Short cycle assessments provide the information a teacher needs to create a micro-map for how to teach specific curriculum units. Analyses of the state tests provide a good beginning for schools to redesign their overall educational program. Benchmark assessments give feedback on each semester of instruction and often help determine which students need interventions or extra help. Teachers also need additional short cycle assessment and other screening data to design the details of and daily lesson plans for each specific curriculum unit and be more effective in getting all students to learn the main objectives in each curriculum unit to the level of proficiency.

When teachers have the detailed data from these interim assessments, they are able to design instructional activities more precisely matched to the exact learning status of the students in their own classrooms and school. In this way, their instruction can be much more efficient because they know the goals and objectives they want students to achieve, and they know exactly what their students do and do not know with respect to those goals and objectives. With these data, they can design instructional

activities specifically to help the students in their classrooms learn the goals and objectives for the particular curriculum unit.

The costs of these powerful assessments are modest. The EB model provides $25 per student, which is more than sufficient for a school to purchase access to a system, as well as some specific technological equipment and related PD. The Renaissance Learning STAR assessments, and more recently the NWEA MAP system, can function as both interim and benchmark assessments, can be used to progress monitor students with IEPs, can include both math and reading for prekindergarten through grade 12, and can be purchased with this per pupil amount. Some districts have dropped Scantron, NWEA MAP, and AimsWeb assessments and replaced them with the STAR Enterprise system that provides all the information of the previous three at a lower overall cost.

17. Computers, Technology, and Equipment

Over time, schools need to embed technology in instructional programs and school management strategies. Today, more and more states require students not only to be technologically proficient but also to take some courses online to graduate from high school. Further, there are many online education options – from state-run virtual schools, such as those in Florida and Wisconsin, to private sector companies, such as K12 Inc. and Connections Academy, that run virtual charter schools. "Blended instruction" or "flipped classroom" models, such as Rocketship, have also emerged (Whitmire, 2014). These programs infuse technology and online teaching into regular schools, provide more one-to-one student assistance, and put the teacher into more of a coaching role (see Odden, 2012). Research also shows that these technology systems work very well for many students and can work very effectively in schools with high concentrations of lower income and minority students (Whitmire, 2014). Moreover, they can be less costly than traditional public schools (Battaglino, Haldeman, & Laurans, 2012; Odden, 2012).

Current Evidence-Based Recommendation
$250 per pupil for school computer and technology equipment

Analysis and Evidence

Infusing technology into the school curriculum has associated costs for computer hardware, networking equipment, software, training, and personnel associated with maintaining and repairing these machines.

The *total cost* of purchasing and embedding technology into the operation of schools identifies both the direct and indirect costs of technology and its successful implementation:

- *Direct costs* of technology include hardware, software, and labor costs for repairing and maintaining the machines; and
- *indirect costs* include costs of users supporting each other, time spent in training classes, casual learning, self-support, user application development, and downtime costs.

This Element (17) identifies only direct technology costs because the indirect costs, which are primarily training, are included in the overall PD resources (Element 14). Districts also need individuals to serve as technical support for technology embedded curriculum and management systems, though the bulk of that work can be covered by warranties purchased at the time computers are acquired.

In estimating the direct costs of purchasing, upgrading, and maintaining computer hardware, the software that helps these computers function and the networks on which they run, the EB approach recognizes the fact that today virtually no school is beginning at a baseline of zero. All schools have a variety of computers of varying ages, the large majority of which are connected to school networks and the Internet. Unlike the 1990s when expensive projects had to retrofit schools with data networks, the following cost estimates identify resources needed to maintain and enhance the technology base that exists in schools. Moreover, as should be clear, these are ongoing and not one-time costs.

Most school districts have technology plans, and each district and school situation is unique and should be described in its plan. These documents, if up-to-date, should be meaningful mechanisms used to allocate resources to the areas of most need within the school or district environment.

The study team refers readers to a more detailed analysis of the costs of equipping schools with ongoing technology materials (Odden, 2012) that was spearheaded by Scott Price, former chief financial officer of the South Pasadena School District in California and current chief financial officer for the Los Angeles County Public Schools, who serves as a consultant to POA on technology costs. The analysis estimated four categories of technology costs that totaled $250 per student. The amounts by category should be considered flexible, as districts and schools will need to allocate dollars to their highest priority technology needs outlined in state and district technology plans. The per student costs for each of the four subcategories are:

- Computer hardware: $71;
- operating systems, productivity, and non-instructional software: $72;
- network equipment, printers, and copiers: $55; and
- instructional software and additional classroom hardware: $52.

This per student figure would be sufficient for schools to purchase, upgrade, and maintain computers, servers, operating systems and productivity software, network equipment, student administrative system, and financial systems software, as well as other equipment such as copiers. Since the systems software packages vary dramatically in price, the figure would cover medium-priced student administrative and financial systems software packages.

The original analysis of the $250 per student figure, beginning in 2006 and reconfirmed in 2012 (Odden, 2012), allowed a school to have one computer for every three students. This ratio was sufficient to provide every teacher, the principal, and other key school-level staff with a computer and have an actual ratio of about one computer for every three to four students in each classroom. Over the last few years,

computer makers have developed alternative products, such as netbooks and Chromebooks that have a lower entry price point of about $350 per unit compared to the $700 to $800 cost for laptop or desktop computers. For school districts that value lowering the student-to-computer ratio, purchase of these devices provides an opportunity to significantly increase the number of student devices when replacing traditional units at the end of their life.

As the ratio of these new devices to traditional devices increases, there will be opportunity for districts to explore one-to-one student-to-computer ratios at key grade levels. As high stakes computerized testing is pushed further into the primary grade levels, it is essential that students are able to comfortably use computers to demonstrate their knowledge. If students have not had sufficient practice with computers in a testing environment, computerized testing can become a barrier to successfully measuring student achievement. If students cannot comfortably type, text responses become more of a test of "hunt and peck" skills than a reflection of a student's ability to respond to a prompt.

Though Chromebooks use a different operating system than typically used in the educational environment, most instructional and interactive testing software is browser-based, making the instructional software agnostic regarding operating systems. Additional software is continually developed for these new platforms as they become more commonly used in the educational space. Chromebooks and other such platforms are still not appropriate for the school site or district administrative office functions.

Taking the factors above into consideration, and recognizing that the average cost of computer units can change if new, less expensive platforms are incorporated into the instructional setting, the EB model continues to recommend the $250 per student cost. This figure also permits districts to move closer to a one-to-one student-to-computer ratio.

In the past, the EB model has recommended that districts either incorporate maintenance costs in lease agreements or, if purchasing the equipment, buy 24-hour maintenance plans to eliminate the need for school or district staff to fix computers. For example, for a very modest amount, one can purchase a maintenance agreement from a number of computer manufacturers that guarantees computer repair on a next business day basis. In terms of educator concerns that it would be difficult for a manufacturer's contractors to serve remote communities, the maintenance agreement makes meeting the service requirements the manufacturer's or contractor's responsibility and not the district's. Many of the private sector companies that offer such services often take a new or reconditioned computer with them, leave it, and take the broken computer to fix, which often turns out to be more cost effective than sending technicians to fix broken computers. On the other hand, when districts analyze the cost of warranty programs for Chromebooks or similar low-cost hardware, they may find that it is more practical to replace broken machines than to pay for extended warranties.

As the number of computers in schools increases, it becomes more impractical to hard-wire connections into classrooms or other instructional spaces. Wireless connectivity is the only solution to creating an

instructional environment in which Internet access is available anywhere, anytime on campus. Depending on campus configuration, it is possible to serve a small group of wireless computers with just a few wireless access points. However, as the number of computers being simultaneously used increases, additional access points must be added.

The original $250 per pupil figure included modest funds to complete small on-campus infrastructure improvements. This remains the case in the EB recommendation for technology, which remains at $250 per pupil for site-based technology.

18. Career and Technical Education Teachers and Equipment/Materials

Vocational education, or its modern term, career and technical education (CTE), has experienced a shift in focus during the past decade. Traditional vocational education focused on practical, applied skills needed for wood and metalworking, welding, automobile mechanics, typing and other office assistance careers, as well as courses in home economics.

Today, many argue that vocational and technical education, or "voc-tec," should instead be "info-tech," "nano-tech," "bio-tech," and "health-tech." As the demand increases for jobs in the fields of information, technology, biology, and medicine, it makes sense to alter voc-tec programs so that they can teach students specific technical skills for use in emerging and/or fast-growing job markets. The American College Testing Company and many policy makers have concluded that the knowledge, skills, and competencies needed for college are quite similar to those needed for work in the higher-wage, growing jobs of the evolving economy, so all students need a solid academic high school program to be college and career-ready when they graduate from high school.

Current Evidence-Based Recommendation
$10,000 per CTE teacher for specialized equipment

Analysis and Evidence

A key question is whether new CTE programs require more resources. Many districts and states believe that new career-technical programs cost more than the regular program and even more than traditional vocational classes. However, in a review conducted for a Wisconsin school finance adequacy task force, a national expert on career-technical education (Phelps, 2006) concluded that the best of the new career-technical programs did not cost more, especially if the district and state made adequate provisions for PD (as teachers in these new programs needed training) and computer technologies (as computer technologies were heavily used). These conclusions were generally confirmed by the cost analysis the study team conducted of Project Lead the Way (PLTW), one of the most highly rated and allegedly "expensive" CTE programs in the country.

PLTW (www.pltw.org) is a nationally recognized exemplar for secondary CTE education. Often implemented jointly with local postsecondary educational institutions and employer advisory groups,

these programs usually feature project- or problem-based learning experiences, career planning and guidance services, and technical and/or academic skills assessments. Through hands-on learning, the programs are designed to develop the science, technology, engineering, and mathematics (STEM) skills essential for achievement in the classroom and success in college or jobs not requiring a four-year college education. Today, PLTW is offered in more than 5,000 elementary, middle, and high schools in all 50 states and enrolls over 500,000 students.

The curriculum features rigorous, in-depth learning experiences delivered by certified teachers and administers end-of-course assessments. High-scoring students earn college credit recognized by more than 100 affiliated postsecondary institutions. Courses focus on engineering foundations (design, principles, and digital electronics) and specializations (such as architectural and civil engineering and bio-technical engineering) that provide students with career and college readiness competencies in engineering and science. Students need to take math through Algebra 2 to handle the courses in the program, which also meets many states' requirements for science and other mathematics classes.

The major cost areas for the program are in class size, PD, and computer technologies. Most programs recommend class sizes of 25, a figure equal to secondary class sizes provided by the EB Funding Model. The PD and most of the computer technology costs are covered through the PD and technology components of the EB model. However, a few of the PLTW concentration areas require a one-time purchase of expensive equipment, which can be covered by a $10,000 allocation per career-technical education teacher. To implement this recommendation, Maryland would need to specify standards for CTE courses, then collect the number of FTE CTE teachers for each school.

The core resources of class size and PD, together with the above additional equipment resources, are sufficient to fund the CTE programs that are typically included in Maryland schools (Maryland State Department of Education, 2012).

19. Extra Duty Funds/Student Activities

Elementary, middle, and high schools typically provide an array of non-credit producing after-school programs, from clubs and bands, to sports and enrichment activities. Teachers supervising or coaching these activities usually receive small stipends for these extra duties.

Current Evidence-Based Recommendation
$250 per student for co-curricular activities including sports and clubs for kindergarten through grade 12 (Funding not provided for prekindergarten)

Analysis and Evidence

Research shows, particularly at the secondary level, that students engaged in student activities tend to perform better academically than students not as involved (Feldman & Matjasko, 2005), although too much extracurricular activity can be a detriment to academic learning (Committee on Increasing High

School Students' Engagement and Motivation to Learn, 2004; Steinberg, 1996, 1997). Feldman and Matjasko (2005) found that participation in interscholastic (as compared to intramural) sports had a positive impact for both boys and girls on grades, postsecondary education aspirations, reducing dropout rates, lowering alcohol and substance abuse, and attending more years of schooling. The effect was particularly strong for boys participating in interscholastic football and basketball. One reason for these impacts is that participation in interscholastic athletics placed students in new social groups that tended to have higher scholastic aspirations and those aspirations rubbed off on everyone. But, the effects differed by race and gender and were not as strong for black students.

During the past several years, the EB model has allocated between $200 and $300 per pupil for student activities, including intermural sports. These figures are in line with average amounts spent on such activities in many states. Currently, the EB model includes an overall figure of $250 per pupil.

Central Office Functions

In addition to school-based resources, education systems also need resources for district-level expenditures including operations and maintenance and the central office, as outlined below. The study does not address transportation.

20. Operations and Maintenance

The lack of a strong or consistent research base complicates computation of operations and maintenance costs. Many models allocate a percentage of current expenditures to operations and maintenance. The EB model uses formulas to compute the number of personnel needed *at the school-level* for custodial, maintenance, and grounds work.

Current Evidence-Based Recommendation
Separate computations for custodians, maintenance workers, and groundskeepers as outlined in the analysis and evidence section below

Analysis and Evidence

Drawing on professional standards in the field as well as research, the EB method has conducted analyses of the cost basis for maintenance and operations (e.g., Picus & Odden, 2010; Picus & Seder, 2010). The discussion below summarizes the research on operations and maintenance, identifying the needs for custodians (school-level), maintenance staff (district-level), and groundskeepers (school- and district-level), as well as the costs of materials and supplies to support these activities.

Custodians: Custodians are responsible for the daily cleaning of classrooms and hallways as well as for routine furniture setups and takedowns. In addition, custodians often manage routine and simple repairs like minor faucet leaks and clean cafeterias/multipurpose rooms, lockers, and showers. Custodial workers' duties are time-sensitive, structured, and varied. Zureich (1998) estimates the time devoted to various custodial duties:

- Daily duties (sweep or vacuum classroom floors, empty trash cans and pencil sharpeners in each classroom, clean one sink with faucet, and ensure the security of rooms), which take approximately 12-minutes per classroom;
- weekly duties (dust reachable surfaces, dust chalk trays and clean doors, clean student desk tops, clean sink counters and spots on floors, and dust chalk/white boards and trays), each of which adds five-minutes a day per classroom; and
- non-cleaning services (approximately 145-minutes per day) provided by custodians include: opening school (checking for vandalism, safety and maintenance concerns), playground and field inspection, miscellaneous duties (teacher/site-manager requests, activity set-ups, repairing furniture and equipment, ordering and delivering supplies), and putting up the flag and PE equipment.

Nelli (2006) developed and updated a formula that takes into consideration these cleaning and non-cleaning duties. The formula takes into account teachers, students, classrooms, and gross square feet (GSF) in the school. The formula is:

- One custodian for every 13 teachers, plus
- one custodian for every 325 students, plus
- one custodian for every 13 classrooms, plus
- one custodian for every 18,000 GSF, and
- this total divided by four.

The formula calculates the number of custodians needed at prototypical schools. The advantage of using all four factors is that it accommodates growth or decline in enrollment and continues to provide schools with adequate coverage for custodial services over time.

Maintenance Workers: Maintenance workers function at the district-level, rather than at individual schools. Core tasks provided by maintenance workers include preventative maintenance, routine maintenance, and emergency response activities. Individual maintenance worker accomplishments associated with core tasks are: (1) HVAC systems, HVAC equipment, and kitchen equipment, (2) electrical systems and equipment, (3) plumbing systems and equipment, and (4) structural work, carpentry, and general maintenance/repairs of buildings and equipment (Zureich, 1998).

Zureich (1998) recommends a formula for maintenance worker FTEs incorporated into the funding model for instructional facilities as follows:

[(# of Buildings in District) × 1.1 + (GSF / 60,000 Sq. Ft.) ×

1.2 + (Enrollment / 1,000) × 1.3

+ General Fund Revenue/5,000,000) × 1.2] / 4

= Total Number of Maintenance Workers Needed

A review of state facility standards suggests that for prototypical schools of the sizes used in the EB model, approximate gross square footage should be 63,000 for elementary and middle schools and 110,000 for a high school. In addition, allowances are needed for central functions including a central office, warehousing, and maintenance and operations facilities. The study team estimates these three facilities would require an additional 25,000 GSF of space. Maintenance and custodial supplies are estimated at $1.00 per gross square foot, which for the prototypical district is 623,000 square feet.

The Florida Department of Education has released a new set of facilities guidelines that discuss custodial and maintenance personnel. The guidelines are similar to those developed for Maryland. Although they would potentially generate a few more staff positions in the largest districts, the changes tend to use the same approach to estimating personnel needs, and, when combined with the allocation and use data below, lead to a recommendation that recalibration is not needed at this time.

Grounds Maintenance: The typical goals of a school grounds maintenance program are generally to provide safe, attractive, and economical grounds maintenance (Mutter & Randolph, 1987). This is also a district-level function. Although groundskeepers generally work in teams and visit schools on a less than daily schedule, the study team estimated groundskeeper resources based on the number of schools. Specifically, the study team estimated that an elementary school needs the equivalent of 0.25 FTE groundskeeper staff, middle school 0.5 FTE groundskeeper staff, and high school 1.5 FTE groundskeeper staff.

Utilities: It is necessary to add the per student costs of utilities and insurance to these totals. It is unlikely that a district has much control over these costs in the short term and thus each district can best estimate future costs using their current expenditures for utilities and insurance as a base. The utilities cost is estimated at $305 per student.

21. Central Office Staffing/Non-personnel Resources

All districts require central office staff to meet the overall management needs of the educational programs. In other states, the study team developed an EB staffing model using a prototypical district of approximately 3,900 students. The team also developed an approach for central office staffing for districts with fewer than 1,000 students, which does not apply in Maryland. For Maryland, the study

team developed a model for resourcing the central office of a 12,000-student prototypical district, which is discussed in Section 4.

Current Evidence-Based Recommendation
The EB model computes a dollar per student figure for the central office based on the number of 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.

Analysis and Evidence

POA has identified resources for these positions in other reports and the most recent version of the team's textbook (Odden & Picus, 2014; Picus & Odden, 2010), drawing on a variety of research studies and professional standards for best practices. Over the past several years, the study team has developed central office staffing recommendations in several states including Maine, New Jersey, North Dakota, Washington, Wisconsin, and Texas. In all states, the study team began its analysis with the research of Elizabeth Swift (2007), who used PJ panels to determine staffing for a prototypical district. Swift's research addressed the issue of the appropriate staffing for a district of 3,500 students. Swift's work formed the basis of each state's analysis, although in three states (Washington, Wisconsin, and North Dakota) the study team also conducted EBPJ panels to review the basic recommendations that emerged from the research.

Through that work, the study team estimated the central office resources required for a district of 3,500 students. The initial studies provided for about eight professional staff (superintendent, assistant superintendent for curriculum, business manager, and directors of human resources, pupil services, technology, and special education) and nine clerical positions.

Although the research basis for staffing school district central offices is relatively limited, analysis in the Educational Research Service (ERS) staffing ratio report shows that, nationally, school districts with between 2,500 and 9,999 students employ an average of one central office professional/administrative staff member for every 440 students (Educational Research Services, 2009). This equates to about eight central office professionals (7.95) in a district of 3,500 students. The study team's research-based staffing formula of eight FTE professional staff matches the ERS estimate of eight FTE central office staff for a school district of 3,500 students nationally. Because the 3,500-student district size did not readily incorporate the EB model's prototypical schools – parameters for which are needed to estimate maintenance and operations costs – over the past few years the study team increased its prototypical district size to 3,900 students to include four 450-student elementary schools, two 450-student middle schools, and two 600-student high schools. This larger size also allowed us to add the testing and evaluation, and central office computer staff, which districts argue are needed today. Further, in recent analyses, the study team received a recommendation to add individuals who work with schools to provide the first-line technical help (installing computers and software, ensuring wireless systems operate, keeping printers operating, and providing related technical assistance to keep computers

operating). The recommendation was one school computer technician for every 600 students working in school but operating from the central technology office, which adds 6.5 positions to the central office.

Moreover, the EB model has been short on central resources for special education and related services. In summer 2015, the study team asked a group of superintendents to design central office staff for several sizes of districts. For a 4,000-district office, they recommended two speech pathologists and two psychologists be added.

In addition to staffing, central offices need a dollar per student figure for such costs as insurance, purchased services, materials and supplies, equipment, association fees, elections, district-wide technology, communications, and other costs; that figure is approximately $350 per pupil. Table 3.5 summarizes these staffing proposals organized into departments into which a central office could be organized.

TABLE 3.5

EVIDENCE-BASED CENTRAL OFFICE STAFFING FOR DISTRICT WITH 3,900 STUDENTS

Office and Position	FTE		FTE	
	Previous Evidence-Based Model		Current Evidence-Based Model	
	Admin	Classified	Admin	Classified
Superintendent's Office				
Superintendent	1		1	
Secretary		1		2
Business Office				
Business Manager	1		1	
Director of Human Resources	1		1	
Accounting Clerk		1		2
Accounts Payable		1		2
Secretary		1		1
Curriculum and Support				
Assistant Supt. for Instruction	1		1	
Director of Pupil Services	1		1	
Speech Pathologist			2	
Psychologists			2	
Dir. of Assessment & Evaluation	1		1	
Secretary		3		3
Technology				
Director of Technology	1		1	
Network Supervisor (Hardware)		1		1
Systems Supervisor (Software)		0.3		1
Computer Technician		1		6.5
Secretary		1		2
Operations and Maintenance				
Director of O&M	1		1	
Secretary		1		2
Total Central Office Staffing (3,900 Students)	8	10	10	22.5

The table shows the staff in the previous EB central office as well as the staff in the newer 3,900-student central office that includes the additional positions discussed above. Larger districts would be provided the resources for a larger central office by prorating up the per-student cost of this 3,900-student central office and could have more differentiated staff with coordinators as well as a full-fledged legal counsel for large districts.

The study team knows that school districts in Maryland are larger than the 3,900-student prototypical EB district. Thus, the team sought advice from the EBPJ panels that were asked to review the core EB analyses and report those results in the following section on EBPJ panel recommendations.

Resources for students at risk of academic failure

The core staffing section of this document contains positions for supporting teachers and students beyond the regular classroom core teacher. Those positions include elective or specialist teachers, tutors, and pupil support personnel. However, in many instances, additional support for students at risk of academic failure is also needed. The programs described in this section extend the learning time for students at risk of academic failure in focused ways. The key concept is to implement the maxim of standards-based education reform: keep standards high for all students, but vary the instructional time so all students can achieve to proficiency levels. The EB elements for extra help are also embedded in the "response to intervention" schema described at the beginning of this section.

The study team used two specific counts of pupils.

1. All LEP students, regardless of their FRPM eligibility.
2. All FRPM-eligible students who are not included in the LEP count.

In the discussion that follows, all resources for at risk students are provided for all LEP students (regardless of FRPM eligibility) and all non-LEP FRPM-eligible students. Additional resources are provided for LEP students in addition to the at risk resources.

The EB model provides substantial additional resources for students based on the at risk student counts including tutoring, extended day, summer school, and pupil support. These resources for students struggling to achieve to academic standards should be viewed in concert with resources for students with identified disabilities. Districts sometimes over-identify students for special education services as the "only way" to trigger more resources for some students at risk of academic failure. The study team's goal in expanding resources for students at risk of academic failure triggered by at risk counts is to provide adequate resources for all students at risk of academic failure, with or without a diagnosed disability and to reduce over-identification in special education.

This section includes discussion of seven categories of services: (1) tutoring, (2) additional pupil support, (3) extended day, (4) summer school, (5) programs for LEP students, (6) alternative schools, and (7) special education.

22. Tutors

The first strategy to help students at risk of academic failure is to provide additional support as described in Element 8 above. In addition to the one core tutor position provided to every prototypical school discussed above for Element 6, the EB model provides additional tutor positions at the rate of one for every 125 at risk students.

Current Evidence-Based Recommendation
1.0 FTE tutor position for every 125 at risk students (in addition to the 1.0 FTE tutor position in each prototypical school) These positions are provided additional days for PD (Element 14) and substitute days (Element 7) discussed above

Analysis and Evidence

The most powerful and effective extra help strategy to enable students at risk of academic failure to meet state College and Career-Ready Standards, including Common Core standards, is individual one-to-one tutoring provided by licensed teachers (Shanahan, 1998; Wasik & Slavin, 1993). Students who must work harder and need more assistance to achieve to proficiency levels especially benefit from preventative tutoring (Cohen, Kulik, & Kulik, 1982). Tutoring program effect sizes vary by the components of the approach used, e.g. the nature and structure of the tutoring program, but effect sizes on student learning reported in meta-analyses range from 0.4 to 2.5 (Cohen, Kulik & Kulik, 1982; Shanahan, 1998; Shanahan & Barr, 1995; Wasik & Slavin, 1993) with an average of about 0.75 (Wasik & Slavin, 1993).

The impact of tutoring programs depends on staffing and organization, link to the core program, and tutoring intensity. Researchers (Cohen, Kulik, & Kulik, 1982; Farkas, 1998; Shanahan, 1998; Wasik & Slavin, 1993) and experts on tutoring practices (Gordon, 2009) have found greater effects when the tutoring includes:

- Using professional teachers as tutors;
- initially providing one-to-one tutoring to students;
- using tutors trained in specific tutoring strategies;
- closely aligning tutoring to the regular curriculum and specific learning challenges, with appropriate content-specific scaffolding and modeling;
- allowing sufficient time for tutoring; and
- highly structuring programming, both substantively and organizationally.

Several specific structural features of effective one-to-one tutoring programs include:

- First, each tutor would tutor one student every 20 minutes, or three students per hour. This would allow one tutor position to tutor 18 students a day. (Since tutoring is such an intensive

activity, individual teachers might spend only half their time tutoring; but a 1.0 FTE tutoring position would allow 18 students per day to receive one-to-one tutoring.) Four positions would allow 72 students to receive individual tutoring daily in the prototypical elementary and middle schools;

- Second, most students do not require tutoring all year long; tutoring programs generally assess students quarterly and change tutoring arrangements. With modest changes such as these, nearly half the student body of a 400-student school unit could receive individual tutoring during the year; and
- Third, not all students who are from a low-income background require individual tutoring, so a portion of the allocation could be used for students in the school who may not be from a lower income family but have a learning issue that could be remedied by tutoring. This also is part of the rationale for including one tutor in each prototypical school, regardless of the number of at risk students.

Though this discussion focuses on *individual* tutoring, schools could also deploy these resources for small group tutoring. In a detailed review of the evidence on how to structure a variety of early intervention supports to prevent reading failure, Torgeson (2004) shows how one-to-one tutoring, one-to-three tutoring, and one-to-five small group sessions (all Tier 2 interventions) can be combined for different students to enhance their chances of learning to read successfully.

One-to-one tutoring would be reserved for the students with the most severe reading difficulties, scoring at or below the 20th or 25th percentile on a norm-referenced test or below basic level on state achievement tests. Intensive instruction for groups of three to five students would then be provided for students above those levels but below the proficiency level.

It is important to note that the instruction for all student groups needing extra help needs to be more explicit and sequenced than that for other students. Young children with weakness in letter recognition, letter sound relationships, and phonemic awareness need explicit and systematic instruction to help them first decode and then learn to read and comprehend. As Torgeson (2004:12) states:

> Explicit instruction is instruction that does not leave anything to chance and does not make assumptions about skills and knowledge that children will acquire on their own. For example, explicit instruction requires teachers to directly make connections between letters in print and the sounds of words, and it requires that these relationships be taught in a comprehensive fashion. Evidence for this is found in a recent study of preventive instruction given to a group of highly at risk children in kindergarten, grade one and grade two […..] only the most [phonemically] explicit intervention produced a reliable increase in the growth of word-reading ability … schools must be prepared to provide very explicit and systematic instruction in beginning word-reading skills to some of their students if they expect virtually all children to acquire word-reading skills at grade-level by grade three …. Further, explicit instruction also requires that the meanings of words be directly taught and be explicitly practiced so that they are accessible when children are reading text….

> Finally, it requires not only direct practice to build fluency…. but also careful, sequential instruction and practice in the use of comprehension strategies to help construct meaning.

Torgeson (2004) goes on to state that meta-analyses consistently show the positive effects of reducing reading group size (Elbaum, Vaughn, Hughes & Moody, 1999) and identifies experiments with both one-to-three and one-to-five teacher-student groupings. Though one-to-one tutoring works with 20 minutes of tutoring per student, a one-to-three or one-to-five grouping requires a longer instructional time for the small group – up to 45 minutes. The two latter groupings, with 45 minutes of instruction, reduced the rate of reading failure to a miniscule percentage.

For example, if the recommended numbers of tutors are used for such small groups, one FTE reading position could teach 30 students a day in the one-to-three setting with 30 minutes of instruction per group and more than 30 students a day in the one-to-five setting with 45 minutes of instruction per group. Four FTE tutoring positions could then provide this type of intensive instruction for up to 120 students daily. In short, though the emphasis is on one-to-one tutoring, and some students do need one-to-one, other small group practices, which characterize the bulk of Tier 2 interventions, can also work, with the length of instruction for the small group increasing as the size of the group increases.

Though Torgeson (2004) states that similar interventions can work with middle and high school students, the effect is often smaller as it is much more difficult to undo the lasting damage of not learning to read once students with severe reading deficiencies enter middle and high schools. However, a new randomized control study (Cook et al., 2014) discussed below found similarly positive impacts of a tutoring program for adolescents in high poverty schools *if* it was combined with counseling. This is possible in the EB model as it includes such additional nonacademic pupil support resources (see Element 23 discussion).

The rationale outlined above is strengthened by two recent randomized controlled trials of the effectiveness of tutoring for students at risk of academic failure, which support the study team's logic for providing a minimum level of tutor support in all schools as well as additional tutors for schools with greater need. At the elementary level, using a randomized controlled trial, May, et al. (2013) assessed the impact of tutors in a Reading Recovery program. In the third year of a five-year evaluation, they found that Reading Recovery tutoring had an effect size of 0.68 on overall reading scores relative to the population of students eligible for such services in the specific study and a 0.47 effective size relative to the national population of grade one struggling readers. The effects were similarly large for reading words and reading comprehensive sub-scales.

For students in high schools, Cook, et al. (2014) reported on a randomized controlled trial of a two-pronged intervention that provided disadvantaged youth with tutoring *and* counseling. They found that intensive individualized academic extra help – tutoring – combined with non-academic support seeking to teach grades nine and 10 youth social-cognitive skills based on the principles of cognitive behavioral therapy (CBT) led to improved math and reading performance. The study sample consisted mainly of

students from low-income and minority backgrounds, who generally pose the toughest challenges. The effect size for math was 0.65 and for reading was 0.48. Also, the combined program appeared to increase high school graduation by 14 percentage points (a 40 percent hike). The authors concluded that this intervention seemed to yield larger gains in adolescent outcomes per dollar spent than many other intervention strategies.

These studies are highlighted for several reasons. First, they represent new, randomized controlled trials – the gold standard of research supporting the efficacy of tutoring. Second, they show that tutoring can work not only for elementary but also for high school students, whereas most of the tutoring research addresses only elementary-aged students. Third, they show that tutoring can work even in the most challenging educational environments. Fourth, they bolster the EB argument below that extra help resources in schools triggered by at risk status should also include some non-academic, counseling resources, as the treatment in the second study was tutoring combined with counseling.

In earlier adequacy reports and even in the recently published fifth edition of the study team's textbook (Odden & Picus, 2014), recommendations included tutor positions to be provided based on at risk student counts. The recommended ratio was one position for every 100 at risk students, with a minimum of one for each prototypical school. As a result, a school without any at risk students would receive the minimum of one tutor position for students at risk of academic failure, but a school with 100 at risk students would receive the same single tutor, even though it might have more need for tutor resources. Today, educators and policy makers across the country argue that schools with few low-income students still have students who struggle to learn to proficiency and more rigorous CCRS lead to greater numbers of students at risk of academic failure in the future. Those arguments are convincing, and the study team has modified the EB recommendations for tutoring resources.

The revised EB model provides one tutor per Tier 2-intervention position in each prototypical school. In parallel with that change, the EB model adjusts the ratio for additional tutor positions to one position for every 125 at risk students. The new EB recommendation for tutor per Tier 2-intervention positions is more generous than the previous recommendation of one tutor per 100 at risk students with a minimum of one for each prototypical school. For example, under the old EB model, a prototypical school with no at risk students would receive one position, as would a prototypical school with 100 at risk students. The revised EB model calls for 1.0 FTE position at a school with no at risk students. For a school with 100 at risk students, the model provides 1.0 FTE tutor position plus an additional 0.8 FTE (100/125) position for the 100 at risk students, for a total of 1.8 FTE positions. Both the old and revised EB models would provide five positions for a school with 500 at risk students.

23. Additional Pupil Support

Core pupil support positions for guidance counselors and nurses are discussed above in core resources as Element 10. At risk students, however, generally have more non-academic needs that should be addressed by additional pupil support staff. Such staff could include more guidance counselors, as well as social workers, family liaisons, and psychologists. Thus, in addition to the core guidance counselor

and nurse positions provided to every prototypical school discussed above for Element 10, the EB model provides additional pupil support position at the rate of one for every 125 at risk students.

Current Evidence-Based Recommendation
1.0 FTE pupil support position for every 125 at risk students These positions are provided additional days for PD (Element 14) discussed above

Analysis and Evidence

At risk students tend to have more non-academic issues for schools to address. This usually requires interactions with families and parents as well as more guidance counseling in school. The EB model addresses this by providing more staffing resources to meet these needs. Although there are many ways schools can provide outreach to parents or involve parents in school activities – from fundraisers to governance – research shows that school-sponsored programs that have an impact on achievement address what parents can do at home to help their children learn. For example, if the education system has clear content and performance standards, such as the State's new college and career readiness standards, programs that help parents and students understand both what needs to be learned under the standards and what constitutes an acceptable level of academic performance have been found to improve student outcomes. Parent outreach programs that explicitly and directly address what parents can do to help their children be successful in school and to understand the standards of performance that the school expects are the types of school-sponsored parent activities that produce discernible impacts on students' academic learning (Steinberg, 1997).

At the secondary school level, the goal of parent outreach programs is to have parents learn what they should expect of their children in terms of academic performance. If a district or a state requires a minimum number of courses for graduation, such as Maryland's 21 credits, the school should make those requirements clear. If either average scores on end-of-course examinations or a cut-score on a comprehensive high school test are required for graduation, they too should be discussed. Secondary schools need to help parents understand how to more effectively assist their children in identifying an academic pathway through middle and high school, understand standards for acceptable performance, and be aware of the coursework necessary for college entrance. This is particularly important for parents of students in the middle or lower end of the achievement range, as often these students know very little of the requirements for transition from high school to postsecondary education (Kirst & Venezia, 2004).

At the elementary level, parental outreach and involvement programs should concentrate on what parents can do at home to help their children do academic work for school. Too often parent programs focus on fundraising through the parent-teacher organization, involvement in decision making through school site councils, or other non-academically focused activities at the school site. Although these school-sponsored parent activities may impact other goals, such as making parents feel more comfortable being at school or involving parents more in some school policies, they have little effect on

student academic achievement. Parent actions that impact learning include: (1) reading to children at young ages, (2) discussing stories and their meanings, (3) engaging in open-ended conversations, (4) setting aside a place where homework can be done, and (5) ensuring that children complete homework assignments.

The resources in the EB funding model are adequate to create and deploy the ambitious and comprehensive parent involvement and outreach programs that are part of two comprehensive school designs: Success for All and Comer School Development Program. The Success for All program includes a family outreach coordinator, a nurse, a social worker, a guidance counselor, and an education diagnostician for a school with about 500 students. This group functions as a parent outreach team for the school, serves as case managers for students who need non-academic and social services, and usually includes a clothing strategy to ensure all students, especially in cold climates, have adequate clothes and coats to attend school.

The Comer program was created on the premise of connecting schools more to their communities. Its parent-school team has a somewhat different composition and focuses on training parents to raise expectations for their children's learning, working with social service agencies, and working with the school's faculty to raise expectations for what students can learn. Sometimes the team co-locates on school site premises to provide a host of social services.

A program called Communities in Schools, which now operates in 26 states and the District of Columbia and is referenced by the resources provided by this model component, has been successful in raising school attendance rates, as students need to attend school to learn. The program adds a caseworker, often trained in social work, to a school's pupil support team to help match social services provided by non-educational agencies to students who need them.

24. Extended Day Programs

At both elementary and secondary school levels, some students at risk of academic failure are likely to benefit from after-school or extended day programs, even if they receive tutoring/Tier 2 interventions during the regular school day. Extended day programs provide academic support as well as a safe environment for children and adolescents to spend time after the school day ends during the regular school year.

Current Evidence-Based Recommendation
1.0 FTE teacher position for every 30 at risk students or 3 ⅓ FTE 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 1.0 FTE teacher position for every 120 at risk students

Analysis and Evidence

In a review of research, Vandell, Pierce and Dadisman (2005) found that well-designed and administered after-school programs yield numerous improvements in academic and behavioral outcomes (see also Fashola, 1998; Posner & Vandell, 1994). On the other hand, the evaluation of the 21st Century Community Learning Centers (CCLC) program (James-Burdumy et al., 2005), though heavily debated, indicated that for elementary students, extended day programs did not appear to produce measurable academic improvement. Critics of this study (Vandell, Pierce & Dadisman, 2005) argued that the control groups had higher pre-existing achievement, which reduced the potential for finding program impact. They also argued that the small impacts identified had more to do with lack of full program implementation during the initial years than with the strength of the program.

Overall, studies have documented positive effects of extended day programs on the academic performance of students in select after-school programs (e.g., Takoata & Vandell, 2013; Vandell, 2014). However, the evidence is mixed because of research methods (few randomized trials), poor program quality, and imperfect implementation of the programs studied. Researchers have identified several structural and institutional supports necessary to make after-school programs effective:

- Staff qualifications and support (staff training in child or adolescent development, after-school programming, elementary or secondary education, and content areas offered in the program; staff expertise; staff stability/turnover; compensation; institutional supports);
- program/group size and configuration (enrollment size, ages served, group size, age groupings and child-staff ratio) and a program *culture of mastery;*
- consistent participation in a structured program;
- financial resources and budget (dedicated space and facilities that support skill development and mastery, equipment and materials to promote skill development and mastery, curricular resources in relevant content areas, and a location accessible to youth and families);
- program partnerships and connections (with schools to connect administrators, teachers, and programs; with larger networks of programs; with parents and community); and
- program sustainability strategies (institutional partners, networks, linkages, community linkages that support enhanced services, and long-term alliances to ensure long-term funding).

The resources recommended in the EB model could be used to provide students at risk of academic failure in all elementary grades and in secondary schools additional help during the school year, but before or after the normal school day. Because not all at risk students need or will attend an after-school program, the EB model assumes 50 percent of the eligible at risk students will attend the program – a need and participation figure identified by Kleiner, Nolin, and Chapman (2004). As a result, providing resources at a rate of 1.0 FTE teacher to 30 at risk students will result in class sizes of approximately 15 in extended day programs.

The State should monitor the degree to which the 50 percent figure accurately estimates the numbers of students needing extended day programs. The study team also encourages Maryland to require

districts to track the students participating in the programs, their pre- and post-program test scores, and the specific nature of the after-school program provided. This will develop a knowledge base of which after-school program structures have the most impact on student learning. The study team recognizes that how these extended day services are provided will vary across Maryland's school districts, and that any monitoring of the impacts of these resources should focus more on impacts on student performance than on the strategy for providing the services. The study team also found that most of the schools studied in other states with improved student performance had various combinations of before- and after-school extra help programs.

25. Summer School

Many students need extra instructional time to achieve to the state's high proficiency standards. Thus, summer school programs should be part of the set of programs available to provide students at risk of academic failure the additional time and help needed to achieve standards and earn academic promotion from grade to grade (Borman, 2001). Providing additional time to help all students master the same content is an initiative grounded in research (National Education Commission on Time and Learning, 1994). Summer school services are provided outside of the regular school year.

Current Evidence-Based Recommendation
1.0 FTE teacher position for every 30 at risk students or 3 ⅓ 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 1.0 FTE teacher position for every 120 at risk students

Analysis and Evidence

Research dating to 1906 shows that students *on average* lose a little more than a month's worth of skill or knowledge over the summer break (Cooper, Nye, Charlton, Lindsay & Greathouse, 1996). Summer breaks have a larger deleterious impact on low-income children's reading and mathematics achievement. This loss can reach as much as one-third of the learning during a regular nine-month school year (Cooper et al., 1996). A longitudinal study by Alexander and Entwisle (1996) showed that these income-based summer learning differences *accumulate* over the elementary school years, such that low-income children's achievement scores – without summer school – fall further and further behind the scores of middle class students as they progress through school. There is emerging consensus that what happens (or does not happen) during the summer can significantly affect the achievement of students from low-income and at risk backgrounds and can help reduce (or increase) the low-income and minority achievement gaps in the United States.

Evidence on the effectiveness of summer programs in attaining these goals is mixed. Though past research linking student achievement to summer programs shows promise, several studies suffer from methodological shortcomings and low quality of the summer school programs (Borman & Boulay, 2004).

A meta-analysis of 93 summer school programs (Cooper, Charlton, Valentine & Muhlenbruck, 2000) found that the average student in summer programs outperformed about 56 percent to 60 percent of similar students not receiving the enrichment. However, the certainty of these conclusions is compromised because only a small number of studies (e.g., Borman, Rachuba, Hewes, Boulay & Kaplan, 2001) used random assignment, and program quality varied substantially. More recent randomized controlled trial research of summer school reached more positive conclusions (Borman & Dowling, 2006; Borman, Goetz & Dowling, 2009). Roberts (2000) found an effect size of 0.42 in reading achievement for a randomized sample of 325 students who participated in the Voyager summer school program.

Researchers (see McCombs et al., 2011) note several program components related to improved achievement effects for summer program attendees including:

- Early intervention during elementary school and a full six- to eight-week summer program;
- a clear focus on mathematics and reading achievement, or failed courses in high schools;
- small-group or individualized instruction;
- parent involvement and participation;
- careful scrutiny for treatment fidelity and good instruction in reading and mathematics; and
- monitoring student attendance.

Summer programs that include these elements hold promise for improving the achievement of at risk students and closing the achievement gap. Indeed, the most recent review of the effects of summer school programs reached this same conclusion (Kim & Quinn, 2013). Their meta-analysis of 41 school- and home-based summer school programs found that kindergarten through grade eight students who attended summer school programs with teacher-directed literacy lessons showed significant improvements in multiple areas including reading comprehension, with effects much larger for students from low-income backgrounds.

In sum, research generally suggests that summer school is needed and can be effective for at risk students. Studies suggest that the effects of summer school are largest for elementary students when the programs emphasize reading and mathematics and for high school students when programs focus on courses students failed during the school year. The more modest effects frequently found in middle school programs can be partially explained by the emphasis in many middle school summer school programs on adolescent development and self-efficacy, rather than academics.

Because summer school can produce powerful impacts, the EB model provides resources for summer school for classes of 15 students for 50 percent of all at risk students in kindergarten through grade 12, an estimate of the number of students still struggling to meet academic requirements (Capizzano, Adelman & Stagner, 2002). The model provides resources for an eight-week program and a six-hour day, which allows for four hours of instruction in core subjects. A six-hour day would also allow for two hours of non-academic activities. The formula would be one FTE position for every 30 at risk students or 3.33 per 100 such students. Because not all at risk students will need or will attend a summer school

program, the EB model assumes 50 percent of the eligible at risk students will attend the program – a need and participation figure identified by Kleiner, Nolin, and Chapman (2004). Although a summer school term of six to eight weeks will have fewer hours than five-day a week extended day programs, the EB resources this at the same rate to allow for teacher planning time for the summer school program – something that is less needed in extended day programs. Simplified, the EB summer school formula equates to 1.0 FTE teacher position for every 120 at risk students.

26. Limited English Proficient Students

Research, best practices, and experience show that LEP students need assistance to learn English, in addition to instruction in the regular content classes. This can include some combination of small classes, English as a Second Language (ESL) classes, PD for teachers to help them teach "sheltered" English classes, and reception centers for districts with large numbers of LEP students who arrive as new immigrants to the country and the school throughout the year.

LEP is a separate program from the at risk programs described above in the sections on tutors, extra pupil support, extended day and summer school. Funding is provided for all LEP students for these additional services regardless of FRPM status.

The total resources available to all LEP students (those FRPM eligible and those not) include one tutor position for every 125 LEP students, one pupil support position for every 125 LEP students, and any extended day and summer school teacher resources to which the LEP student count leads.

Current Evidence-Based Recommendation
1.0 FTE 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

Analysis and Evidence

Good LEP programs work, whether the approach is structured English immersion (Clark, 2009) or initial instruction in the native language, often called bilingual education. However, bilingual education is difficult to provide in most schools because students come from so many different language backgrounds. Nevertheless, bilingual programs have been studied intensively. A best-evidence synthesis of 17 studies of bilingual education (Slavin & Cheung, 2005) found that LEP students in bilingual programs outperformed their non-bilingual program peers. Using studies focused primarily on reading achievement, the authors found an effect size of +0.45 for LEP students. A more recent randomized controlled trial also produced strong positive effects for bilingual education programs (Slavin et al., 2011), but concluded that the language of instruction is less important than the approaches taken to teach reading.

Addressing that important issue in The Elementary School Journal, Gerstein (2006) concluded that LEP students can be taught to read in English if, as shown for monolingual students, the instruction covers phonemic awareness, decoding, fluency, vocabulary, and reading comprehension. Gerstein's studies also showed that LEP students benefit from instructional interventions initially designed for monolingual English speaking students, the resources for which are included above in the four at risk student triggered programs: tutoring, extended day, summer school, and additional pupil support.

Beyond the provision of additional teachers to provide ESL instruction to students or other types of extra help for LEP students; however, research shows that LEP students need a solid and rigorous core curriculum as the basis from which to provide any extra services (Gandara & Rumberger, 2008; Gandara, Rumberger, Maxwell-Jolly & Callahan, 2003). This research suggests that LEP students need:

- Effective teachers – a core goal of all the staffing in this report. A recent study found that teachers who are effective with non-LEP students are also effective with LEP students, and vice versa. In addition, this study found that effective teachers who are fluent in the LEP student's native language are even more effective with those students (Loeb, Soland & Fox, 2014);
- adequate instructional materials (Element 15) and good school conditions;
- good assessments of LEP students so teachers know in detail their English language reading and other academic skills (Element 16);
- less segregation of LEP students;
- rigorous and effective curriculum and courses for all LEP students, including college and career-ready, and affirmative counseling of such students to take those courses; and
- PD for all teachers, focusing on sheltered English teaching skills (Element 14).

Hakuta (2011) supports these conclusions. Hakuta notes that English language learning takes time (one reason the EB model includes the above resources for every grade-level) and that "academic language" is critical to learning the new Common Core standards. The new standards require more explicit and coherent LEP instructional strategies and extra help services, if these are to be effective at ensuring that LEP students learn the subject matter English generally and academic English specifically, i.e. learn how to read content texts in English. While this instruction requires smaller regular classes, they are provided by the EB model, particularly at the early elementary level.

However, additional teachers are needed to provide ESL instruction during the regular school day, such as having LEP students take ESL in lieu of an elective course. Although the potential to eliminate some elective classes exists if there are large numbers of LEP students who need to be pulled out of individual classrooms, it is generally agreed that to fully staff a strong ESL program, each 100 LEP students should trigger one additional FTE teaching position. This makes it possible to provide additional instructional opportunities for LEP students to receive an additional dose of English instruction. The goal of this programming is to reinforce LEP student learning of academic content *and* English so at some point the students can continue their schooling in English only.

Research shows that it is the LEP students from lower income, and generally less educated backgrounds, who struggle most in school and need extra help to learn both academics and English. The EB model addresses this need by making sure that the ESL resources triggered by just LEP pupil counts are *in addition* to other Tier 2 intervention resources, including tutoring, additional pupil support, extended day and summer school resources as well as pupil support staff (Elements 22 to 25).

For example, a prototypical school with 125 at risk students and no LEP students would receive 1.0 FTE core teacher and pupil support staff, and in addition, approximately 1.0 FTE tutor position, 1.0 FTE extended day, 1.0 FTE summer school, and 1.0 FTE additional pupil support resources. However, if the 125 at risk children were all LEP students, the school would receive an *additional* 1.25 FTE teacher positions primarily to provide ESL instruction.

Given these realities, it is more appropriate to view the EB approach to extra resources for LEP students as including both resources for students from at risk backgrounds (unduplicated FRPM recipients and LEP) and ESL specific resources (Jimenez-Castellanos & Topper, 2012). That is a major reason why the EB model today augments the at risk student count to include the unduplicated count of students who are either FRPM recipients or LEP. This ensures that all LEP students trigger the extra resources for the Tier 2 interventions as well as the resources for ESL instruction.

27. Alternative Schools

Current Evidence-Based Recommendation
1.0 assistant principal position and one teacher position for every seven alternative education students

Analysis and Evidence

A small number of students have difficulty learning in the traditional school environment. The Alternative Learning Environment (ALE) students this report addresses are those who also have some combination of significant behavioral, social, and emotional issues, often also including alcohol or drug abuse. Such students often do much better in small "alternative learning environments." However, this rationale for ALE does not consider alternative schools for students who simply prefer a different approach to learning academics, such as project-based learning or more applied learning strategies used in new CTE programs such as computer-assisted engineering. The EB concept of alternative schools, which is also the State's concept, is for troubled youth who need counseling and therapy embedded in the school's instructional program.

The Institute for Education Sciences at the U.S. Department of Education published statistics on alternative schools and programs for the 2007-08 school year (Carver & Lewis, 2010). The study identified 558,300 students in 10,300 districts that administered alternative education schools and programs across the United States. Although the report did not provide data on the size of these schools or on staffing ratios, the data above suggest an average alternative school size of 54 students. Most of the programs served students in grades nine through 12.

The main reasons students were enrolled in alternative programs, all of which meet the study team's initial definition of severe emotional and/or behavioral problems, included:

- Possession or use of firearms or other weapons;
- possession, distribution, or use of alcohol or drugs;
- arrest or involvement with the criminal justice system;
- physical attacks or fights;
- disruptive verbal behavior;
- chronic truancy;
- continual academic failure;
- pregnancy/teen parenthood; and
- mental health needs.

One of the major issues states face in creating funding programs for alternative schools is defining them. The study team's 2010 review of literature and state practice on alternative education provided little guidance for developing a clear definition of alternative education. More recently, and as part of implementing its compulsory attendance laws, Maryland commissioned a study to review state definitions of alternative education programs (see Porowski, O'Conner & Luo, 2014). Maryland needed a definition because attendance in an alternative education program was an exemption in its compulsory attendance law and the State did not have a clear definition of such programs. The study found great variation across the states in both defining and structuring alternative education programs. Because individual states or school districts define and determine the features of their alternative education programs, they tended to differ in key characteristics, such as target populations, setting, services, and structure.

A formal definition of an alternative education program would need to consider the target population (including both grade-levels served and types of students), program setting (within a public school or outside such a structure), program offerings (academic, behavioral, counseling, social skills, career counseling, etc.), and structure (how programs are scheduled, staff responsibilities, etc.). The Porowski, O'Conner & Luo (2014) study found wide variation across states (and districts) for all four elements.

The study team concluded that the 2006 Urban Institute (Aron, 2006) definition of alternative education closely follows the team's understanding of such programs, and this definition is aligned with the intent of such programs in Maryland:

> Alternative education refers to schools or programs that are set up by states, school districts, or other entities to serve young people who are not succeeding in a traditional public school environment. Alternative education programs offer students who are failing academically or may have learning disabilities, behavioral problems, or poor attendance an opportunity to achieve in a different setting and use different and innovative learning methods. While there are many different kinds of alternative

> schools and programs, they are often characterized by their flexible schedules, smaller teacher-student ratios, and modified curricula.

There is also the issue of standards for alternative education programs. Most states use definitions similar to that of the Urban Institute, but only one state, Indiana, has established standards for what an alternative education program might look like. The Indiana Department of Education's (2010) website states that:

> While each of Indiana's alternative education programs is unique, they share characteristics identified in the research as common to successful alternative schools:
>
> - Maximum teacher/student ratio of 1:15;
> - small student base;
> - clearly stated mission and discipline code;
> - caring faculty with continual staff development;
> - school staff having high expectations for student achievement;
> - learning program specific to the student's expectations and learning style;
> - flexible school schedule with community involvement and support; and
> - total commitment to have each student be a success.

The study team concludes that these characteristics align with the EB view of alternative education programs.

From work in other states, the study team found that funding formulas for alternative schools differ substantially. In a few states, the typical staffing ratio for an alternative school is one administrative position for the school plus one teacher position for every seven to 10 students. Because alternative high schools are generally designed to serve students who are severely at risk, it is recommended they remain relatively small. Because of the small size of alternative schools, staff at these schools often must fill multiple roles. Many teachers in alternative schools provide many different services for students, including instruction, pupil support, and counseling services. This suggests that the staffing structure and organization for instruction in alternative high schools is usually quite different from that found in typical high schools.

Though the State could launch a process to more formally define alternative education programs as well as set standards for them, it might also want to adopt the above definition. It could also include a maximum size for any alternative education programs that would trigger alternative education funding. The EB model staffs alternative education programs with 1.0 FTE assistant principal position and 1.0 FTE teacher position for every seven alternative students and assumes the programs enroll fewer than 100 students.

28. Special Education

Providing appropriate education services for students with disabilities, while containing costs and avoiding over-identification of students, particularly minority students, presents several challenges (see Levenson, 2012). Many mild and moderate disabilities, often those associated with students learning to read, are correctable through strategic early intervention. This intervention includes effective core instruction as well as targeted Tier 2 intervention programs, particularly one-to-one tutoring (Elements 6 and 22). For those who require special programs as identified through an IEP, the EB model relies on a census-based funding formula that provides additional teaching and aid resources based on the total number of students in a school. As described below, these resources are expected to meet the instructional needs of children with mild and moderate disabilities. For children with severe disabilities, the EB model recommends that the State pay the entire cost of their programs, minus the cost of the basic education program for all non-public placements.

Current Evidence-Based Recommendation
1.0 FTE teacher position for every 150 students in the school 1.0 FTE aide position for every 150 students in the school Deduction of federal Title VIb funds Full state funding for students with severe disabilities, minus the cost of the basic education program for all non-public placements

Analysis and Evidence

In Frattura and Capper's (2007) book on the best approaches to serve students with disabilities, they conclude that both research and most leading educators recommend educating students in general education environments results in higher academic achievement and more positive social outcomes for students with and without disability labels, as well as being the most cost-effective way to educate students. Thus, they recommend that school leaders focus their efforts on preventing student underachievement and alter how students who struggle are educated. Doing so, they argue, will overcome the costly and low performance outcomes of multiple pull-out programs. Further, fewer students will be inappropriately labeled with a disability and more students will be educated in heterogeneous learning environments, thus yielding higher student achievement and more equitable distribution of achievement (Frattura & Capper, 2007).

The core principles of such a proactive approach to teaching students with disabilities are (1) education system needs to adapt to the student, (2) primary aim of teaching and learning is to prevent student failure, (3) aim of all educators is to build teacher capacity, (4) all services must be grounded in the school's core teaching and learning, and (5) students must be educated alongside their peers in integrated environments (Frattura & Capper, 2007).

Supporting this argument, research shows that many mild and moderate disabilities, particularly those associated with students learning to read, are correctable through intensive early intervention. For example, several studies (e.g., Borman & Hewes, 2003; Landry, 1999; Slavin, 1996) have documented that through a series of intensive instructional interventions (e.g. small classes, a rigorous reading curriculum, one-to-one tutoring), nearly 75 percent of struggling readers identified in kindergarten and grade one can be brought up to grade-level without the need for placement in special education. Other studies have noted decreases in disability labeling of up to 50 percent with interventions of this type (see for example, Levenson, 2011; Madden, Slavin, Karweit, Dolan & Wasik, 1993; Slavin, 1996).

That is why the EB recommendations for extended learning opportunities (Elements 22, 24, and 25) are so important. They, along with core tutoring and pupil support services, are the series of service strategies that can be implemented before special education services are needed. This sounds like a common-sense approach that would be second nature to educators, but in many cases educators have been rooted in a "categorical culture" that must be corrected through PD and strong leadership from the district office and the site principal. Using a census approach to providing most of the extra resources for students with disabilities, an approach increasingly used across the country, works best for students with mild and moderate disabilities, but only if a functional, collaborative early intervention model (as outlined above) is also implemented.

This proactive approach to special education is evident in the Individuals with Disabilities Education Act (IDEA) of 2004, which changed the law about identifying children with specific learning disabilities. The reauthorized law states that schools will "not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability..." (Section 1414(b)). Instead, in the Commentary and Explanation to the proposed special education regulations, the U.S. Department of Education encourages states and school districts to abandon the IQ-achievement discrepancy model and adopt RTI models (also discussed above) based on recent research findings (Donovan & Cross, 2002; Lyon et al., 2001; President's Commission on Excellence in Special Education, 2002; Stuebing et al., 2002). An RTI model, called a proactive approach within this report, identifies students who are not achieving at the same level and rate as their peers, and provides appropriate interventions, the first ones of which should be part of the regular school program and not funded with special education resources (Mellard, 2004). The core features of RTI, which are a critical part of the EB approach, include:

- High-quality classroom instruction;
- research-based instruction;
- classroom performance;
- universal screening;
- continuous progress monitoring;
- research-based interventions, that would include one-to-one tutoring;
- progress monitoring during interventions; and
- fidelity measures (Mellard, 2004).

Common attributes of RTI implementations are (1) a strong core instructional program for all students, (2) multiple tiers of increasingly intense student interventions, (3) implementation of a differentiated curriculum, (4) instruction delivered by staff other than the classroom teacher, (5) varied duration, frequency, and time of interventions, and (6) categorical or non-categorical placement decisions (Mellard, 2004). This proactive model fits seamlessly into the EB broader approach to helping all students at risk of academic failure through early interventions.

In many instances, this approach requires school-level staff to change their practice and cease functioning in silos that serve children primarily in pull-out programs identified by funding source for the staff member providing the services (e.g. General Fund, Special Education, Title I). Instead, all staff members would collaborate closely with the regular classroom teacher to identify deficits and work together to correct them as quickly as possible.

For children with more severe disabilities, clustering them in specific schools to achieve economies of scale is generally the most effective strategy and provides the greatest opportunity to find ways to mainstream them (to the extent feasible) with regular education students. Students in these categories generally include severely emotionally disturbed (ED), severely mentally and/or physically handicapped, and children within the autism spectrum. The ED and autism populations have been increasing dramatically across the country, and it is likely that this trend will continue. To make the provision of services to these children cost-effective, it makes sense to explore clustering of services where possible and design cost parameters for clustered services in each category. In cases where students need to be served individually or in groups of two or three because of geographic isolation, it would be helpful to cost out service models for those configurations as well, but provide full state funding for those children. This strategy would reduce the likelihood of overwhelming the financial capacity of a small school district that happens to be the home of a child with a severe disability.

The census approach to funding core special education services can be accomplished by providing additional teacher resources at a fixed level – the EB recommendation now is 1.0 FTE teacher and 1.0 FTE aide for every 150 regular students.

The census approach emerged across the country for several reasons:

- Continued rise in the number and percentage of “learning disabled” students and continued questioning by some of the validity of these numbers;
- underfunding of the costs of severely disabled students;
- over-labeling of low-income, minority, and LEP students into special education categories, which often leads to lower curriculum expectations and inappropriate instructional services; and
- reduction of paperwork.

Often, the census approach for the high-incidence, lower-cost students with disabilities is combined with a different strategy for the low-incidence, high-need students, whose costs are funded separately

and totally by the State (with the exception of basic education funding), as these students are not found proportionately in all districts. This is the catastrophic funding for school districts that provide resources for special education students who require services exceeding some specified amount, such as $15,000 (after Medicaid, federal special education grants, and other available third-party funding is applied).

Today, diverse states such as Alabama, Arkansas, California, Montana, North Dakota, Pennsylvania, Massachusetts, and Vermont all use census-based special education funding systems. Moreover, all current and future increases in federal funding for disabled students are distributed on a census basis.

Staff Compensation

As is usually done in most adequacy studies, the EB approach, as well as the successful schools and PJ methods, to costing out the above recommendations is to use the average of the previous year's staff salaries to put a salary "price" on each staff element of the funding model. Staff would include the major certified categories such as teacher, principal, superintendent, assistant superintendent, as well as the major classified categories such as secretary, custodian, maintenance worker, groundskeeper, and supervisory aide.

In some cases, adequacy studies explicitly include a market analysis of salaries; for example, comparing teacher salaries to salaries of workers in other occupations with similar skills and competencies to teaching. These market analyses are not part of the current study. Therefore, average salaries from the preceding year, 2014-15, will be used as the salary price to cost out the various elements of the model in the process of identifying both a new base per pupil figure and appropriate pupil weights.

However, benefits present a set of issues that need to be addressed in more detail. Benefits generally include:

- Retirement or pension costs;
- health insurance;
- Social Security and Medicare;
- workers' compensation; and
- unemployment insurance.

These are usually calculated as a percent of salary. For example, today Social Security and Medicare costs are 7.65 percent of salary, though Social Security contributions are capped at an annual salary of $118,500. To reflect this, the costing model includes 6.2 percent of salary for all salaries up to $118,500 and nothing above that. Medicare is computed as 1.45 percent of total salary.

The State generally sets retirement costs. In some cases, the State pays pension costs directly to the retirement fund, and that cost is not included in local district costs. Maryland has experienced recent changes regarding which level of government pays pension costs for school district employees. The study team developed the new base per pupil figure on an appropriate assumption about the percent of

salaries that should be paid for pensions and the share of pension costs paid by local districts/counties, by the State, and by individuals. These costs were included in the compensation figure used to calculate the new per pupil amount. Though school districts are all contained within Maryland counties or Baltimore City, and the county or city technically pays pension costs, the rate is generally set by the State. In Maryland, the employer contribution rate is approximately 14.56 percent, and 10 percentage points of this total is paid directly by the State, leaving 4.56 percent as the district responsibility. In costing out the above recommendations, the district responsibility of 4.56 percent is used as the local cost for pensions for certified staff. A figure of 8.17 percent is used for pension costs for classified staff.

Health insurance costs pose a more complex challenge. Costs of health insurance often vary substantially across districts, which usually have different approaches to covering health care, including self-insurance. Rates often differ for individuals, couples, and families. Typically, the State does not explicitly state its fiscal responsibility for health insurance costs for school district employees, and unspecified amounts for such coverage are included in the base school funding formula. Moreover, many states' school funding formulas under-support actual health insurance costs.

Health care costs need to be directly addressed in an adequacy study to ensure this part of the compensation is adequately reflected in any cost figure. In a recent study in North Dakota, the study team found that the State average cost for health insurance for all *state* employees was about $12,000. Though the State had not explicitly adopted a policy of health care coverage for school district employees, the decision was made, with the assent of the legislative committee for which the study was conducted, to use the figure used for state employees as an "indirect" indicator of how the State would recognize health insurance costs in the school aid formula. This decision was bolstered by a previous state policy that allowed school districts to opt into the State health care program. Thus, in calculating a new per pupil figure for North Dakota, the $12,000 state figure was used for all staff categories. Wyoming also uses a state health insurance cost figure in its school aid formula.

The study team took the same approach in Maryland, and included the average cost the state health insurance program for state employees of $8,537 in estimating the cost of health insurance for school districts.

Unemployment insurance is estimated by Maryland to be 2.8 percent of salary.

Workers compensation is estimated at 0.55 percent for certified employees and 0.0218 percent for classified employees (figures obtained from a study team survey of all district business officers).

Section 4: Evidence-Based Professional Judgment Panels

Introduction

As part of the study team's EB approach to estimating school finance adequacy, the study team conducted four evidence-based professional judgment (EBPJ) panels across Maryland. The purpose of these panels was to seek input from educational professionals on the content and elements of the EB

model described in Section 3. At each panel meeting, the study team shared the elements of the EB model and then asked the panel members to reflect on those elements and provide the study team with a Maryland-specific reflection as to how each will operate in Maryland. Based on the feedback from these panels the study team noted several areas where adjustments to the EB model might be considered in estimating school finance adequacy using the EB model.

This section describes the outcomes of the four EBPJ panels the study team met with in June 2015. The findings from these panels were used to refine the EB model and adjust the model as appropriate. There were three overall outcomes from the EBPJ panels. In many instances, the panel members felt the recommendations in the EB model would work well in Maryland. In other instances, their recommendations led to changes in the study's EB model for Maryland. In a few cases, panelists expressed some concerns about the parameters of the model, but there is not a research-based alternative for the study's current EB recommendations. In those instances where the study team's interpretation of the research diverges from recommendations made at the EBPJ panels, the study team provides a detailed description of these differences. The study team has documented its rationale for recommendations and has provided sufficient information for state policy makers to determine which approach to fund. The simulation capacity of the Excel model will enable alternative recommendations to be modeled in real time and cost projections provided to policy makers as they review this report.

Professional Judgment Panels

The study team conducted four EBPJ panels on June 23 and 24. EBPJ panels were held across the State with the goal of including all regions of the State and ensuring representation from both urban and non-urban school district staff. The EBPJ panels were held in the following locations:

June 23

- Eastern Maryland (non-urban), Washington College in Chestertown, MD
- Western Maryland (non-urban), Allegany College of Maryland, Cumberland, MD

June 24

- Southern Maryland (urban), Prince George's Community College, Largo, MD
- Northern Maryland (urban), Harford Community College, Harford, MD

There were approximately 20 panelists at each EBPJ panel meeting. Panelists were nominated by education community stakeholders and school officials, vetted by the Maryland State Department of Education, and invited to attend the panel meetings. The study team specifically sought to include a range of school staff at each EBPJ session. The goal was that half of the members of each panel would be teachers from different types of schools (elementary, middle, and high school) as well as teachers with varying work assignments including core subjects/classrooms, elective classes, special education, LEP, and others. The study team wanted teachers with experience in developing curricula and programs to meet the new state standards because that would make them particularly helpful in understanding the resource implications of programs to meet state standards. The study team also sought Maryland

master teachers as well as lead teachers, mentor teachers, instructional coaches, National Board Certified Teachers, LEP teachers, special education teachers, and certificated personnel serving in the role of tutors.

In addition to teachers, the study team asked for participation from school site administrators at all school levels, along with a representative group of central office administrators including superintendents, assistant/associate/deputy superintendents, curriculum directors, special education directors, business managers, and school board members.

All EBPJ panel members were sent a copy of the draft EB report (Sections 1, 2, and 3) several days before the meetings so they could attend the meetings prepared to discuss the details of the initial recommendations. EBPJ panels met for an entire day, starting at 9 a.m. and ending around 4 p.m. Each panel was supported by two POA staff members who presented the outline of the EB model and then sought input as to the implementation of the model's resources on Maryland schools and the allocation of those resources in ways that would improve student learning. The discussion at each EBPJ panel was summarized and combined into one overall summary that forms the basis of this section.

The balance of this section describes the discussion from the EBPJ panels and is presented in the same order as the components of the EB model described in Section 3.

EBPJ Panel Recommendations

As indicated above, EBPJ panel recommendations fell into three categories:

1. Areas where the panelists recommended changes that have a sound research basis or need to be modified to meet state requirements and have been incorporated into the EB model.

2. Areas were panelists recommended changes or identified potential concerns with the EB model, but for now have not been changed in the EB model.

3. Areas where panelists were in general agreement with the EB model recommendations.

The study team considered each of these areas below, identifying the EB model elements from Section 3 in each section.

EBPJ Panel Recommendations

Areas Where the Evidence-Based Model Has Been Changed

There were three areas where EBPJ panel recommendations suggested strong evidence for modifying the EB model as originally presented to the panels. These include (1) prototypical school sizes, (2) addition of one additional teacher position at the prototypical size high school to provide for smaller advanced classes, (3) change in the way LEP resources are described, 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 middle schools and 1,200 students for the prototypical high school. These sizes are still generally within the parameters research suggests for effective middle and high schools.

Element 3: Core High School Teachers (Advanced Courses)

Participants at the EBPJ meetings generally supported the EB class size recommendations and stated that, for the most part, the class size of 25 was lower than most districts are now able to provide. The one concern expressed by panelists was the issue of smaller classes for advanced AP classes and the ability to offer 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 the grade 11 they will have taken the standard high school math curriculum and pre-calculus, and there will be a need to offer more advanced classes – most of which are likely to have relatively low enrollments. In addition, schools, particularly small schools that offer more than one CTE program, often face the need to offer small classes as well.

To accommodate this very real need in high schools, the study team's approach is to assume that about 10 percent of juniors and seniors would require these advanced, smaller classes. In a prototypical school of 600 students (150 per grades nine through 12), this would amount to 30 students. If these 30 students were enrolled in advanced classes as small as six students, it would be possible to offer them instruction in five additional advanced classes with one additional teacher. 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 size. 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 non-advanced courses. One additional teacher in the prototypical high school of 600 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 will include two additional core teachers to provide resources to offer these smaller advanced classes. In addition, since these core teachers would also generate elective teacher resources, there would be another 33⅓ percent FTE elective teacher per teacher in the school. The study team's model adds one advanced course teacher for every 600 students in high schools.

Element 26: LEP Students

As part of the strategies for helping students at risk of academic failure (discussed below in the section on areas not requiring changes), 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 non-duplicated count of FRPM and students. Although the EB model generates substantial resources for all LEP students (FRPM or not) panelists initially stated that the resources for LEP students of one teacher per 100 LEP students were too low, generally not realizing that in the EB model LEP students are included in the at risk student count, which provides them with the tutoring, extended day, summer school, and additional support resources at risk students receive. Because the EB model's at risk count includes all LEP students, LEP students generate all of the at risk resources (teacher tutors, pupil support staff, extended day, and summer school) and an additional teacher for every 100 LEP students.

At the recommendation of one of the panelists, the study team modified the manner in which the EB model provides extra help resources. The change does not alter the level of resources provided to LEP and FRPM students, but makes more explicit the level of resources provided to LEP students. The at risk count is now non-LEP FRPM students and the LEP count now includes all LEP students (FRPM and non-FRPM). Even though the method of the count has changed, LEP students will still 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. The amount of these resources remains the same. This change simply makes more transparent the extensive resources available for LEP students. Several other issues were discussed and are outlined below, although they did not lead to changes in the recommended EB model.

For example, consider a district with 75 LEP students, 40 of whom are FRPM eligible. In addition, there are 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.

There was considerable discussion of the most effective and efficient way to fully serve LEP students. Some districts and schools placed two teachers in LEP classrooms, one with the content expertise and one with ESL expertise, and lowered the class size to 20. That approach is very expensive. Other similar strategies were considered as well.

A LEP teacher in one panel suggested that best way to serve LEP students is for the core teacher to be an expert in sheltered English instruction. That way, the core teacher can teach the core subject in a way that allows LEP students to learn. The irony is that this approach is a no-cost approach but requires teachers of LEP students, who often exhibit multiple native languages in one classroom, to be certified in a core subject and also trained in sheltered English Instruction. This is the approach suggested by the EB model. For Maryland, however, this requires the education system – both universities and school

districts – to begin training teachers in sheltered English instructional techniques. This might not happen immediately, but with the rising number of LEP students entering Maryland classrooms, there should be some urgency to fulfilling this need.

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.

Element 21: Central Office

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. As a result, the study team independently contracted with a group of three former school superintendents with experience in varying size districts from a range of states. They provided central office staffing configurations at a range of district sizes and pointed out that at more than 12,000 students, central office staff can be prorated up uniformly.

Table 4.1 provides the data for the staff in the 12,000-student district. The study team used this model to estimate the per pupil central office costs that were included in the estimate of EB costs for the base program.

TABLE 4.1

EVIDENCE-BASED CENTRAL OFFICE STAFFING FOR DISTRICT WITH 12,000 STUDENTS

Office and Position	EB PJ Panel Modified Modified Evidence-Based Model	
	Admin	Classified
Superintendent's Office		
Superintendent	1	
Secretary/Receptionist		1
Clerk		1
Curriculum and Instruction/Ed Services		
Assistant Superintendent	1	
Director Elementary and Secondary	1	
Director EL	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	
	Admin	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 Specialist	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	
Buyer		2
Payroll Supervisor	1	
Payroll/purchasing Clerk		2
Records Technician		1
Warehouse Manager	1	
Warehouse Worker		2
Director Maintenance and 0perations (M&O)	1	
Assistant M & O Director	1	
Supervisor M & 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		
	40	43

Office and Position	EB PJ Panel Modified	
	Modified Evidence-Based Model	
	Admin	Classified
Total Central Office Staffing (12,000 Students)		

Areas Where EBPJ Panels Recommended Changes Not Included in the Core 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, although in all cases, the Excel EB model can simulate the impact of these changes on the per pupil aid estimate generated by the simulation program. The seven elements are:

1. Prekindergarten.
2. Core elementary teachers.
3. Elective teachers.
4. Guidance counselors and nurses.
5. Principals and assistant principals.
6. Special Education.
7. Alternative schools.

Element 1a: Prekindergarten

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 teachers, along with many of the other resources in the model. The EBPJ panels supported this recommendation. However, two suggestions emerged.

Several panelists noted there is a group of students that 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.

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 potential alternative prekindergarten school locations.

Element 2a: Core Elementary Teachers

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 (for grades six through 12 as well). 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 was not universal across panels or in the panel where it was discussed.

Panelists also asked if there is sufficient classroom space to meet these class size ratios and discussed the issues of capital construction as described immediately above in Element 1a: Prekindergarten.

Element 3a. Elective Teachers

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. This element ties together the issues of elective courses (i.e. art, music, and PE, which is part of the EB model), the school schedule, and sufficient time for teachers to engage in collaborative team planning and work.

The model provides for five 60-minute periods of student-free time for elementary and middle school teachers, and the panels stated that that was not sufficient for both individual planning and prep and collaborative teamwork (although this allocation was more than the three weekly time blocks of student-free time currently provided to most elementary teachers).

The high school elective allocation allows high schools to organize using a block schedule with four 90-minute blocks each day and allows for teachers to teach during three blocks and have 90 minutes each day for individual and collaborative planning (this time period also could be organized as two 45-minute periods).

The EBPJ panels also discussed ways to provide for sufficient time for collaborative teamwork for elementary and middle school teachers. One proposal that emerged was to provide 33⅓ percent electives for both elementary and middle schools, the same as for high schools. This would increase model costs.

Panelists described several middle schools organized into a seven-period schedule with teachers providing instruction for five periods. A schedule using this structure requires elective teachers to be 40 percent of core teachers. This would both reduce core instructional minutes and increase model costs.

EBPJ panelists did provide descriptions of creative ways some elementary and middle schools provide more student-free time for collaborative teamwork. One four-section elementary school combined elective classes into three sections, which produced an additional student-free period every third day. Another group of schools also increased class size for electives to carve out more student-free time for collaboration.

The consensus was that all teachers should be provided with 90 minutes of student-free time daily, which was viewed as sufficient for individual planning and preparation and for collaborative teamwork. Many panelists felt strongly that instructional minutes should be maximized, resulting in a preference for a six-period school day over both a seven-period day and even over a block schedule at the middle and high school levels.

One proposal that emerged from the EBPJ panels offers a solution that is both efficient and cost effective. In discussions, it was suggested that the teacher workday be extended by 30 minutes to a full seven hours, pay teachers more, and move all schools to a six-period schedule. The additional 30 minutes would merit a modest increase in teacher salary costs. Many panelists indicated teachers already worked a longer day to find time for collaboration with colleagues. This suggestion would make that time "official" and encourage all teachers to participate in important collaboration dialogues. In addition, this approach is more cost effective than increasing the number of elective teachers to 33⅓ percent at the elementary and middle school levels.

This suggestion would lead to teachers having 90 minutes a day for planning and collaboration, which could be organized to best meet the needs of each school. Examples of how the day could be organized included a 45-minute period for collaborative teamwork before students arrive for class each day. The rest of the day could be organized so that teachers had individual planning time at different periods of the day and enable schools to offer a 30-minute intervention/enrichment period, a structure that is commonly used today.

Element 8: Guidance Counselors and Nurses

The EB model provides for one guidance counselor for every 450 kindergarteners through grade five students and one for every 250 grades 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.

Element 11: Principals and Assistant Principals

The EB model provides one principal for every 450 students in elementary and middle schools, and one principal and one assistant principal for a 600-student prototypical high school. The EBPJ panels strongly recommended that all prototypical-sized elementary and middle schools have an assistant principal using the following arguments:

- 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 additional school site administrators.

However, the study team 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.

Element 27: Alternative Schools

The EB model provides funding for the equivalent of one assistant principal and one full-time teacher or educational professional for every seven students in an alternative school. Generally, EBPJ panelists felt that for typical alternative schools with between 35 and 75 students, this formula would work well, particularly if alternative school students were defined as children with multiple behavioral and emotional issues, including concern over 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 to alternative schools, the team reports the findings from the EBPJ panels for consideration by state policy makers:

1. 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.

2. 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.

3. Some panelists suggested that alternative schools should be provided for middle schools as well. 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 of students in kindergarten who had not had a schooling experience before enrolling and might need intensive emotional and behavioral attention for the first quarter of the year. The same individuals conceded that a prekindergarten program would alleviate this need. The study team

believes it is a state policy decision to determine the age brackets that qualify for enrollment in an alternative school.

4. 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. The study team supports that suggestion but recommends that it be funded outside the regular funding formula and be considered as part of the LEP program, not as alternative schools.

5. 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 right violations.

Element 28: Special Education

The EB model provides one teacher position and one aide position for every 150 students in a school (this is total students, not special education students). In addition, it suggests funding should be net of federal Title VIb 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 more preventative resources are provided for Tier 2 interventions – tutoring, extended day, summer, and extra pupil support – and those efforts should reduce the need for special education services. As a result, the EB model puts more resources into these Tier 2 strategies and less into special education under the theory that fewer children will need the more intense special education programs.

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. Panelists had difficulty conceptualizing alternative ways of providing special education services if the resources for extra help in the EB model existed. 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), reduced the need for special education and actually had reduced the number of students identified as needing special education services 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.

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.

Areas Where EBPJ Panels Agreed with the Evidence-Based Model Recommendations

For most of the elements of the EB model, the EBPJ panelists generally agreed the resource allocations were adequate for meeting state performance standards. Each of those elements is listed below with any comments from the panels included.

Element 1: Kindergarten. The panels supported the EB model recommendation of one teacher for 15 students.

Element 5: Instructional Coaches. Panels that indicated that the allocation of one coach for every 200 students was higher than is now provided in schools supported the EB model recommendation. There was agreement that coaches are critical to support collaborative time and PD to improve instructional practice. There was also considerable support to make funding of coaches a categorical program to dedicate the funds to coaching positions.

Element 6: Core Tutors. The EB model provides one core tutor for each prototypical school. The EBPJ panels supported this recommendation and pointed out there will be students in every school who are struggling with the new higher Common Core standards and this extra help strategy is important to ensuring they meet the standards.

Element 7: Substitute Teachers. The recommendation that substitutes be provided at the rate of five percent of all core and elective teachers as well as for instructional coaches, tutors, special education, extended day, and summer school teachers was supported. CFOs attending the EBPJ panels indicated this would be sufficient.

Element 9: Supervisory Aides. The EBPJ panels broadly supported the recommendation for two supervisory aides in each prototypical elementary and middle school and three in a prototypical high school. The issue of school resource officers (SROs) was discussed. The majority of panelists said that in

their districts the local police departments funded SROs and further support for such positions was not needed.

Element 10: Librarians. The panelists supported the recommendation of one library media specialist for each prototypical school and suggested the category needed to be renamed Library Media Specialists.

Element 12: School Site Secretarial Staff. The allocation of two secretarial positions at prototypical elementary and middle schools and three secretarial positions at prototypical high schools was generally supported. Some panelists indicated this was more staff than they had at schools in their districts; others said it was somewhat less.

Element 13: Gifted and Talented. The panels supported the recommendation of $30 per student. There was some discussion of the need for more teachers at higher grades to address the movement of some advanced classes to lower grades necessitating small highly advanced classes in the high school. This issue is addressed above in the discussion of core high school teachers. Due to research over the summer, the EB gifted and talented recommendation has been increased to $40 per student as the new price of the Renzulli Learning System, which has been sold to Compass Learning.

Element 14: Professional Development. EBPJ panels supported the PD recommendations in the EB model. These include $125 per student, which is in addition to longer teacher contracts for 10 student-free days of collaborative planning and training and the support for instructional coaches at the school-level.

Elements 15, 16, and 17: Instructional Materials, Interim, Short Cycle Assessments, and Instructional Technology. The panelists were supportive of the EB model allocations of $190 per student for instructional materials, $30 per student for formative and short cycle assessments, and $250 per student for technology. Most of the CFOs on the panels indicated this was more than is currently expended in these three categories. Due to more research performed over the summer, the EB recommendation for short cycle assessments has been reduced to $25 per student to encourage schools to purchase one integrated online battery of such assessments, rather than multiple additional assessment systems.

Element 18: Career and Technical Education. The EBPJ panels supported the recommendation of $10,000 per CTE teacher for advanced computer and technology equipment.

Element 19: Activity Funds and Extra Duty Pay. The panelists supported the recommendation of $250 per student. Most CFOs and high school principals said this would be sufficient for their sports and extracurricular programs, including teacher stipends, equipment, uniforms, etc., and would eliminate the need to pay to play. This funding level also would provide for elementary school activities as well, supporting the sports programs, after-school STEM programs, and others at that level. Prekindergarten students are not eligible for student activity funding under the EB model.

Element 20: Maintenance and Operations. This topic was not discussed in detail, as the panelists did not feel they were knowledgeable in this area.

Elements 23, 24, 25, and 26: Strategies for Students at Risk of Academic Failure. Panelists were generally supportive of the recommendations for these services, but they had several suggestions that led to the changes proposed for the EB model to make resources for LEP and special education students more transparent.

Element 29: Compensation. There was support for, including realistic assumptions about, the cost of health insurance and state retirement programs used in the model.

Summary

This section summarized the reflections and discussion of four EBPJ meetings that took place in June 2015. There were 80 panelists in four locations located across the State. The panels consisted of educators, approximately half of which were teachers and the other half were school site administrators, special education and/or central office administrators, and school board members.

Overall, the panels offered a number of important and helpful suggestions. In three areas, core high school teachers, LEP teachers, and central office staff recommendations lead to changes in the EB model. Although the study team did not modify the EB model in response to suggestions in seven other areas, the capacity to do so through the simulation model being provided to the State will enable policy makers to understand the costs of alternative approaches to the EB model.

For most model elements, there was general agreement among EBPJ panelists that the EB model provides sufficient resources for Maryland school children to meet the state's proficiency standards.

Section 5: Case Studies of Improving Schools, Cross-Case Analysis

Introduction

Between October 2014 and March 2015, POA together with the Maryland Equity Project (MEP)[9] conducted 12 case studies of high performing and improving schools in Maryland. These case studies were intended to inform several adequacy study components about successful school improvement programs and strategies, and the staffing costs of these programs and strategies. 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

[9] The Maryland Equity Project, housed in the College of Education at the University of Maryland College Park is a partner in this study.

changes or augmentation of the model. As this section shows, the cases showed that such changes are not warranted. Write-ups of the 12 individual case studies are provided in separate reports.

Selection of Case Study Schools

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 state MSA tests. For high schools, achievement data were taken from state HSA tests. The primary metric used was the percentage of students who scored proficient or advanced in each school. This same metric was also used to select schools for the successful schools/districts adequacy study, although some modifications are being made to the criteria for the successful schools adequacy approach.

In the interest of selecting schools to represent a range of performance (e.g. status versus growth over time), the research team selected schools from the following 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: In this category, the research team was interested in selecting schools that were successful in significantly reducing the achievement gap between low-income students – those identified as eligible as FRPM eligible – and all students in the school.[10] 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.

[10] The data were not disaggregated to the student-level to allow for comparison between FRPM and non-FRPM students.

The selection process used MSA assessment data from 2007 to 2012 and HSA assessment data from 2008 to 2013. More recent MSA data were not used because Maryland adopted its Common Core-based College and Career-Ready Standards, effective beginning in the 2013-14 school year. Because new assessments were not yet available, the State continued to use the MSA and HSA, though these assessments were not fully aligned with the new standards. This resulted in a decline in MSA and HSA scores across the State. For this reason, upon the recommendation of the MSDE, 2013 and 2014 MSA data were not included in the initial selection of elementary schools. Because there was less of an impact on HSA scores than the MSA scores, the research team was able to use the 2013 HSA data in the selection process for high schools. HSA data for 2014 were not available at the time the case study schools were selected.

As a check to assess whether schools that were high-performing through 2012 continued to perform at a high level, the research team applied one more performance criterion when selecting elementary and middle schools. The MSA scores for 2012 and 2014 were compared, and if the 2014 score decreased by more than one standard deviation, the school was eliminated from the sample.

Finally, the research team wanted to ensure that the selected schools were successful with all students. The research team analyzed schools' student demographics and selected schools with higher concentrations of FRPM-eligible students, LEP students, special education students, and ethnic/minority students. Though the research team did not use specific benchmarks across the board, which would have been especially challenging at the high school level, schools with at least 50 percent FRPM-eligible students, 50 percent ethnic/minority students, 10 percent LEP students, and 15 percent special education students were preferred.

Assessment Data

The MSDE provided the research team with school-level files of assessment scores, disaggregated by student groups (ethnic/minority, FRPM-eligible, LEP, and special education) for the years 2006-2012 (MSA) and 2008-2013 (HSA).

These files were also disaggregated by grade-level and subject. The MSA included scores for reading, math, and science. Depending on the grade, the HSA included scores for English, algebra, and biology. To simplify comparisons across schools, the research team calculated a set of composite scores for each school by aggregating all of the scores by grade and subject into a single all subjects/all grades score for each student group within each school. The final composite scores used to select schools consisted of a FRPM composite, LEP composite, special education composite, and an aggregated all students composite.

School Selections

Twelve schools were selected, with approval from the MSDE, for inclusion in the case studies. The MSDE approved two of the 12 schools in October 2014 so that site visits could be used as part of the researcher training in the case study method described below. The MSDE approved the remaining 10

schools in December 2014, and the research team then contacted those schools to schedule site visits between January and March 2015. The goal was to include three schools in each of the four performance categories. However, one school in the Reducing the Poverty Gap category could not be scheduled. As a result, the final selection consists of two Reducing the Poverty Gap schools and four High-Growth for Student Groups schools (school assignments to each category appear in Table 5.1 below).

The 12 schools selected included the following:

1. Bel Air Elementary, Allegany County.
2. Chadwick Elementary, Baltimore County.
3. Chillum Elementary, Prince George's County.
4. Fairmont Heights High, Prince George's County.
5. James H. Harrison Elementary, Prince George's County.
6. North Frederick Elementary, Frederick County.
7. North Hagerstown High, Washington County.
8. Parkland Middle, Montgomery County.
9. Patterson Park Public Charter, Baltimore City.
10. Redland Middle, Montgomery County.
11. Somerset Intermediate, Somerset County.
12. Wiley H. Bates Middle, Anne Arundel County.

Table 5.1 provides a summary of each school's 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 97 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 less 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.

TABLE 5.1

CHARACTERISTICS OF CASE STUDY SCHOOLS

School (County)	Students	FRPM	LEP	Percent 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	216	48%	<=5	3%	16.7%	High-Performing

School (County)	Students	FRPM	LEP	Percent Minority	Special Education	Performance Category
(Allegany)						
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 (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

Case Study Training and Site Visits

On October 29, 2014, POA conducted a training session on the school case study methodology with the Maryland Equity Project (MEP) staff and graduate students who were going to lead the site visits. The training focused on the link between the EB funding model elements, the components of the theory of school improvement embedded in the EB approach, and the key aspects of the protocol that structured the interviews and data collection in each of the case study schools.

In conjunction with the case study training, the first two site visits were completed on October 28, 2015. Both elementary schools were approved as site visit schools by the MSDE. Scheduling for the remaining 10 site visits occurred in January, with site visits taking place between January 2015 and March 2015. Some schools were visited twice or rescheduled because of inclement weather. Because one of the selected schools did not provide permission to conduct a visit, another site was selected and approved in late February 2015 and visited in March.

A request was sent to each school to provide documents for the case researchers to review before the site visit. To reduce the burden on school staff, only documents in an electronic form that could be sent via email were requested. These documents included site school improvement plans, descriptions of the

curriculum and instructional approaches, daily and weekly bell schedules, staff lists, and any other documents the school thought would be useful as background for the case researchers. Materials on the schools' websites, when available, were also reviewed prior to the site visit. While the documents received from the schools varied, generally the materials helped the case researchers understand the context of the school, and its overall curriculum and instructional approach before conducting the interviews.

The school site visits included 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.

Following each site visit, the case researchers drafted a case study report summarizing the information learned from the document review and site interviews. Case study write-ups followed a similar order:

- 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.

Each case study report then underwent a rigorous internal review using the following process:

- Case study researchers produced an initial draft report;
- senior POA and MEP staff reviewed the initial draft;
- case study researchers revised the draft based on feedback and resubmitted it for review;
- a draft case study document was sent to the school principal for review and comment;
- staff revised the draft incorporating the principal's comments;
- the revised draft was reviewed internally; and
- a final draft submitted to APA for review, and then to the MSDE for final review.

Cross Case Analysis

The final step of the case study process is the cross case analysis, designed to identify common themes and findings across the 12 school sites. Although 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/or to maintain high performance levels, the focus of this cross case analysis is on the resource needs of the strategies implemented by these 12 schools.

The remainder of the cross case analysis is organized into the following sections:

- Overall commonalities among the case study 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.

Overall Case School Commonalities

As should be clear from the way the schools were selected, the cases emphasized strategies that impacted student performance in reading/English/language arts and mathematics, and, in a few cases, science. Thus, the cases did not address other potentially important outcomes or how they were produced. Further, many of the topics included in the case write-ups do not entail resources or specific staffing needs. This cross-case analysis, thus, first summarizes many of these latter strategies.

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 socio-demographics. The goals helped schools set their priorities for time and resources and provided guidance for how to expend energy.

Most schools were in the process of adopting new instructional materials in both reading and math, largely due to the shift to the Common Core-aligned Maryland College and Career-Ready Standards. 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. On the other hand, 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 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 activities of the faculties to identify what pedagogical practices worked in their schools.

The schools had a density of 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, if overall levels of achievement improved notably, and if achievement gaps diminished, 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 for maintaining high levels of performance, for producing large gains in performance, or for reducing achievement gaps linked to poverty or minority status differed. But a review of all cases suggests that such differences among schools did not exist. All schools had goals focused on a) improving their curricula and instructional programs, b) identifying the most effective instructional practices, c) organizing teachers into collaborative work teams that used student data to plan instruction and interventions, d) providing a variety of extra help services to students struggling to learn to standards, e) engaging both administrators and teachers in instructional leadership, and f) creating a cohesive and collaborative culture in which school staff members took responsibility for the results of their actions on student achievement.

Lastly, 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.

Staffing and Class Size

The largest component of school costs is teacher staffing. Teacher staffing is largely determined by the core class size and the number of electives offered by the school. The combination of these two figures reflects, in part, the school schedule and the opportunities for grade- or subject-alike teachers to be provided common planning time in order to engage in collaborate work. This section of the cross case discusses these issues and their connections.

Table 5.2 provides the data on core class sizes and the number of elective teachers as a percentage of the number of core teachers. The table also includes data on the grade-levels served, the number of

students, and the percentage of FRPM students in the school. Core class sizes varied from a low of 19 (for an art integration magnet school in Anne Arundel County) to a high of 27 for a middle school in Montgomery County.

The five elementary schools serving prekindergarten to grade five had core class sizes that varied from 20 to 25. The one prekindergarten to grade eight school had core class sizes of 25.

TABLE 5.2
SCHOOL CORE CLASS SIZE AND ELECTIVES

School	Grades	Students	Percent FRPM	Core Class Size	Percent Elective Teachers
Bel Air	PreK-5	216	48	22	25
Chadwick	PreK-5	548	81	23	17
Chillum	PreK-5	274	85	25	11
North Frederick	PreK-5	590	47	22	25
James H. Harrison	Prek-5	220*	70	20	20
Patterson Park	PreK-8	670	80	25	22
Wiley H. Bates	6-8	800	46	19	34 Supports 2 45-minute planning periods
Parkland	6-8	883	52	26	38
Redland	6-8	545	40	27	38
Somerset	6-7	409	76	20	35
Fairmont Heights	9-12	837	65	25	43
North Hagerstown	9-12	1,280	49	24	28

*Harrison also has 110 additional students in county-wide special education programs located at the school with separate staffing.

An interesting feature of these core class sizes is that teachers in many of the schools commented that the small class size was an important factor in the schools' successes, even though none of the core class sizes in these schools dipped below 20. It should also be noted that the largest class sizes among these six schools were in the schools with the highest percentage of FRPM students. By contrast, the EB model provides average elementary school class sizes of 17.3, which would reduce class sizes for all schools and also significantly reduce class sizes for the highest poverty schools.

The middle school core class sizes were 19 (for an art integration magnet school in Anne Arundel County), 20, 26, and 27, while the two high schools had core class sizes of 24 and 25. Except for the magnet school and the core class sizes of 20 in Somerset Intermediate, these class sizes are closer to the 25 provided by the EB model for secondary schools.

Elective teachers as a percent of core teachers ranged from 11 to 43 percent, but these figures are best analyzed by level of school – elementary versus secondary. Elective teachers as a percent of core teachers for the elementary (prekindergarten to grade five) schools ranged from 11 to 25 percent, with 22 percent for Patterson Park, which is a prekindergarten to grade eight school combining elementary

and middle school levels. As noted in Section 3 of this report, a six-period schedule would require elective teachers at the rate of 20 percent of core teachers, assuming class sizes of core and elective classes were the same. This type of organization would then allow principals to schedule grade alike teachers with common planning times so they could engage in collaborative work. All of these six elementary schools adopted this strategy, but it was more of a challenge in Chillum with the smallest elective teacher allocation. Chadwick created time for teacher collaborative work with its less than 20 percent elective teacher allocation by sometimes having elective classes larger than core classes. The research team would argue that the 25 percent of elective teachers in North Frederick could be reduced to just 20 percent.

The elective teacher allocation for the middle and high schools requires more discussion. As noted in Section 3, a seven-period day with teachers providing instruction for five periods would require a 40-percent elective teacher allocation over core teachers. Two of the middle schools have 38 percent elective teachers and one of the high schools has 43 percent elective teachers. A block schedule of four 90-minute blocks, in which teachers provide instruction for three blocks, requires a 33 ⅓ percent elective teacher allocation over core teachers. Two of the middle schools have approximately this percentage. Finally, a six-period schedule requires only a 20-percent elective teacher allocation; North Hagerstown had moved to a six-period schedule. As a result, its elective teacher allocation reflects this schedule; however, at 28 percent it also indicates that it provides a somewhat higher percentage of electives (28 percent) and as a result, elective classes are likely to be somewhat smaller than core class sizes.

The EB model provides a 20 percent elective teacher allocation for middle schools and a 33 ⅓ percent elective teacher allocation for high schools. These numbers are below what most of the case study middle schools have and different from the two high schools, one of which has a seven-period schedule and the other a six-period schedule.

All schools – elementary, intermediate, middle, and high – managed to carve out time for significant amounts of teacher collaborative work, a practice that research suggests is critical to each school's ability to boost student performance and reduce achievement gaps. North Hagerstown had recently reverted to a six-period schedule (from a block schedule used during the time of its performance gains) and would be able to restore the block schedule if it had the 33 percent elective teacher allocation provided by the EB model.

Collaborative Learning Teams

As noted above, one of the key factors for all schools was the ability for multiple teacher teams to meet during the regular school day. There were multiple purposes for these team meetings. One focus was analyzing student assessment data to determine the appropriate interventions for students struggling to meet academic standards. A second and related activity was to monitor teachers who had been given assessments to determine whether the interventions were working. A third purpose was to plan

instructional lessons for standards-based curriculum units that all teachers would teach simultaneously. And then after giving the same end-of-unit test, the teams would meet to discuss results.

For these collaborative activities to occur, teachers needed common, pupil-free time during the regular school day to meet. This time was only possible if the school had an appropriate mix of core and elective teachers, and if the principal organized all teachers in ways that the right teachers – grade alike and/or course/subject alike – had free time during the same period of the day so the team meetings could occur. As Table 5.2 indicates, all schools with the exception of Chillum and North Hagerstown had sufficient elective teachers to organize the school schedule so that teacher collaborative teams could meet multiple times during the week. The schools, moreover, adopted many different approaches for these team meetings. One school expanded the school day by 30 minutes to allow for both a 45-minute individual planning period and a 45-minute team collaborative period. The key was that all but two of the schools had a sufficient mix of core and elective teaches to allow for the scheduling of collaborative team time. Under the EB model, all schools would be provided a sufficient mix of core and elective teachers so that principals could create school schedules that provided ample time for collaborative teacher work teams to meet multiple times each week.

Interim, Short-Cycle Assessments

Each school case identified several different types of short-cycle, interim assessments that schools and collaborative teacher teams used throughout the school year. Though each school used a different mix of such assessments, they needed the resources to acquire the combination that they ultimately used. Schools used many assessments beyond the State's accountability tests. The schools used benchmark assessments, usually given in the fall, January, and spring to monitor overall student performance during the year and progress toward achieving the desired proficiency levels. The schools also used various combinations of screener and diagnostic assessments, including DIBELS, the screener portions of the NWEA MAP assessments, and Renaissance Learning STAR Enterprise assessments. AIMSWEB was another assessment used by some schools. Nearly all schools used "formative" assessments that had been developed by their county education offices as the systems transitioned to Maryland's new state standards.

The EB model provides a separate allocation for schools to purchase their chosen battery of short-cycle, interim assessments. Without such assessments, the collaborative teacher teams would not have the information needed to plan effective instructional strategies and practices or to assess the effectiveness of those strategies.

Extra Help for Students at Risk of Academic Failure

As each school case indicated, all schools had a range of extra help strategies for students struggling to meet proficiency standards. Most elementary schools had tutors to provide extra help. These tutors were often called reading or math experts. Further, elementary schools had a mix of push-in as well as pull-out supports that included not only reading and math support experts, but also LEP and special

education teachers. Several schools also offered extended day and summer school programming. Many elementary schools also had a 30-minute time block every day for interventions (and enrichment for students not needing interventions). Several elementary schools had specific computer-based programs that provided students with extra drills for math facts and reading fundamentals, including phonics as well as vocabulary. Finally, several elementary schools had bolstered pupil support systems related to the non-academic issues students face.

Most of the elementary schools studied also had prekindergarten programs. A number of the elementary schools claimed that early interventions, including prekindergarten programs, small class sizes (in the upper teens or low 20s) in the early elementary years, tutoring for students struggling in math and/or reading, and flexible student grouping, combined to get more students performing at proficiency levels and reduced the percentage of students labeled with a disability and needing an IEP.

Secondary schools provided less individual tutoring, but most provided some tutoring. Secondary schools more often provided second periods of math or reading to help students struggling to meet standards. Some secondary schools offered semester-length courses for students struggling in some core area, such as reading or mathematics. These are largely no cost strategies as the extra course or class substituted for an elective. In a few cases, though, these additional courses or classes had fewer students, so did require additional resources.

Some high schools provided additional counseling to students at risk of academic failure, underscoring the need for additional pupil support staff, which the EB model provides. Many secondary schools also offered extended day academic extra support, which required additional resources. Finally, most secondary schools also had behavior programs, which entailed some staff as well as professional development for teachers.

The cases were not designed to quantify the level of such extra support, but it seemed the EB model would provide a sufficient level of extra help staffing to financially support the mix and level of extra help services the case study schools provided, including the additional non-academic pupil supports that many schools – both elementary and secondary – provided.

Alignment with the Elements of the Evidence-Based Model

The case study schools' strategies for improving student achievement and reducing the achievement gaps linked to poverty or minority status were highly aligned with the strategies embedded in the EB funding model. The research team did not find any schools whose strategies dramatically differed from the EB model nor did it find elements that would necessitate a change in the EB formulas or ratios. As noted earlier, there were differences across schools. For example, schools did not use the same reading or math curriculum materials, or the same instructional materials in high schools. So, while there were consistencies in the overall strategies, there were also differences in the specifics of the various strategies as determined by local context and the county education systems of each individual school. The research team did not find any schools that used technology as a core of its improvement strategies.

If it had, the EB model's allocation for school-based computer technologies would likely be sufficient for such technology needs.

Summary

During the late fall and early winter, 12 schools were studied to identify their school improvement strategies, the degree to which those strategies were aligned with the strategies embedded in the EB model, as well as whether the school structures and strategies identified by the research team suggested a change in the formulas or ratios used in the EB model. Schools selected represented four categories of performance: high performance, high growth, reducing the poverty gap, and high growth for student subgroups. The schools were selected from all regions of the State.

In general, the improvement strategies in these schools were parallel to those of the EB model. The schools had goals focused on improving student performance in reading and math, and often goals to reduce achievement gaps. To accomplish those goals, the schools revised their curricula 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 for team meetings; engaged teachers in 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 they were able to offer a full liberal arts curriculum that was being revised to reflect Maryland's College and Career-Ready Standards.

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, including the EB model's extended day and summer school provisions.

The research team did not find anything in the case study schools that suggested a major change was needed in any of the EB formulas or ratios.

Section 6: Calculating the Base and Pupil Weights

The EB base and its accompanying pupil weights were then calculated via an EXCEL-based model. Table 6.1 shows the salary data that were used:

TABLE 6.1

2014-15 AVERAGE SALARY BY POSITION

Position	Average Salary
School	
Principal	$118,906
Assistant Principal	$100,948
Teacher	$65,440
Instructional Coach	$81,131
Substitute Teacher	$65,440
Guidance Counselor	$72,415
Nurse	$56,842
Instructional/Supervisory Aide	$29,435
Library Media Specialist	$72,904
School Secretary/Clerical	$43,943
Custodian	$42,607
Maintenance Worker	$56,303
Grounds Maintenance	$42,607
Superintendent	$199,670
Business Manager	$125,820
Director – Personnel/HR	$125,820
Asst. Supt. of Instruction	$156,314
Director of Pupil Services	$125,820
Director of Assessment	$125,820
Director of Technology	$125,820
Director of O&M	$125,820
Secretary/Clerical	$43,943
Network/Systems Supervisor	$75,000
School Computer Technician	$45,000
Speech Pathologist	$74,608
Psychologist	$86,404

The model used the benefit rates provided in Section 3, in the section on compensation on pp.78-79. With these figures, the EB base expenditure per pupil figure is $10,551, with weights of 0.30 for poverty students and 0.38 for LEP students. For all students with mild and moderate disabilities the weight is 0.70.

Chapter II: Bel Air Elementary School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Maryland Equity Project

Submitted by
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Executive Summary

This case of a high performing school is one of 12 school cases being studied as part of a comprehensive study of school finance adequacy in Maryland. The purpose of the cases is to identify the elements of the improvement strategies of the schools studied and to compare them with the elements of the school improvement strategy embedded within the evidence-base (EB) school funding model and then, if needed, to make adjustments in the EB model to reflect the Maryland context.

Four categories of schools were selected for case studies:

1. High performing schools, i.e. schools with a composite score of at least 90 percent of students performing at or above proficiency.
2. Improving schools, i.e. schools that had increased their composite percentage of students performing at or above proficiency by at least 50 percent over a six-year period.
3. Schools that had improved the composite assessment scores of various subgroups (limited English proficient (LEP) students, minority students, etc.) by at least 50 percent over a six-year period.
4. Schools that had reduced the achievement gap of their composite assessment score between free and reduce-priced meals (FRPM) and non-FRPM students by at least two standard deviations over a six-year period.

Bel Air Elementary School is an example of the first category of schools – a high performing school.

Bel Air Elementary School students have consistently achieved high performance rates on math, reading, and science assessments, with over 90 percent of students scoring proficient or above since 2007. The strong performance of all Bel Air students, including subgroups of special education students and students who receive free or reduced-price meals (FRPM), who traditionally score lower than their peers, resulted in Bel Air Elementary being selected for this case study. The study seeks to understand how these results are achieved.

Multiple factors contribute to the school's success. The small size of the school, along with regular parent involvement and a highly dedicated staff, promotes a sense of community. The administration, teachers, and parents have established a welcoming, purposeful environment centered on supporting students.

The principal maintains high standards and is committed to supporting her teachers in their effort to help every student be successful. She leads regular meetings to review data, provides for targeted professional development, and sets school-wide goals. She also led the development of the school's mission of becoming "A School Centered on Reaching Excellence," which promotes academic achievement, character development, and positive social interactions among students, staff, and the community. The teaching staff at Bel Air is characterized by longevity – over half of the teachers have

been there for 10 or more years. Teachers rely on their experience, professional development, and collaboration to meet the needs of every student. The availability of common planning time facilitates regular collaboration and communication among teachers, which leads to sharing best practices and resources to improve learning. Grade-level teachers share daily planning time, and planning time each morning allows for cross-grade planning and planning with the special education and reading intervention teachers.

At Bel Air, instruction in informed by data. Data are collected from a variety of state, local, and classroom assessments. Teachers meet regularly to analyze school-level, classroom, and individual data, and use this information to plan lessons and select resources.

Key instructional practices also contribute to students' success. There is a school-wide emphasis on individualized instruction and meeting the needs of every student. Early intervention ensures that students do not fall behind their peers. Teachers use small, flexible groups in math and reading, incorporate a variety of resources and instructional strategies, and use Universal Design for Learning (UDL) principles to differentiate instruction. Curriculum materials are adapted to meet the needs of students. Teachers are encouraged to incorporate a variety of resources and strategies to enhance the district's curriculum. The special education teacher, reading intervention teacher, and instructional aides provide additional targeted support for students.

Taken together, the strong leadership provided by the principal, the use of instructional practices focused on individual student needs, small class sizes, the availability of collaborative planning time and targeted professional development, and access to resources has created a purposeful environment where students enjoy learning and experience high levels of academic success.

Introduction

Bel Air Elementary School is a small neighborhood school serving students in grades prekindergarten through five. Bel Air Elementary School is located about eight miles from downtown Cumberland, in western Maryland's mountainous Allegany County Public Schools district. Many of the students who attend have parents who also attended this school in years past. Parent volunteers can be seen in the school at almost any given time, and the Parent Teacher Organization is active in planning and supporting activities for students. The community supports the school by attending fundraising events and spirit nights, which are often funded in part by local businesses. Within the school, teachers and students are a close-knit community. Half of the current teaching staff has worked at Bel Air for 10 years or more, and the small size and open design of the school creates an "everyone knows everyone" environment.

Bel Air Elementary School has established a reputation for excellence. In 2007-08 and 2010-11, Bel Air was named a School of Distinction by the Allegany County Board of Education. The school was named a Maryland Blue Ribbon school in 2010 and a National Blue Ribbon School in 2011.

School-wide enrollment has ranged from 215 to 254 students in the past decade. In 2014-15, approximately 216 students enrolled at Bel Air, with an average class size of 20 students. Average class sizes by grade-level are presented in Table 1. The principal noted that class sizes at Bel Air are smaller than those at many other schools in the district. Class sizes have increased across the district because of declining resources. The impact of these cuts on Bel Air has been minimized because of the school's small size and enrollment declines in past years.

Table 1
Bel Air Elementary School Class Sizes, 2014-15 school year

Grade-Level	Class Size
Prekindergarten (1 class)	23
Kindergarten (2 classes)	17.5
One (2 classes)	15.5
Two (2 classes)	17.5
Three (2 classes)	20
Four (1 class)	28
Five (1 class)	24

The school hosts a half-day prekindergarten program. At the time of this site visit, it has one section, but in years when enrollment was higher, there were two sections. There are two sections each of kindergarten and grades one, two, and three. Currently, as a result of an enrollment decrease several years ago, there is one section each of grades four and five. An additional class will be created as the current grade three students advance.

The percentage of Bel Air students who qualify for the FRPM program has increased steadily over the past decade from 36.7 percent in 2004 to 48.1 percent in 2014. The principal anticipates reaching 50 percent FRPM enrollment by the 2015-16 school year, which would make Bel Air Elementary eligible for Title I funding. There was a 15.3 percent mobility rate in 2013-14, which is similar to previous years. The school is 89.2 percent white. The other 10.8 percent of students are mixed-race, Black, Hispanic, and Asian students. All students speak English as their first language. Table 2 shows student characteristics.

Table 2
Bel Air Elementary School Student Characteristics, 2014-15 school year

Student Characteristics	Percentage of Student Population
Race/ethnicity	
American Indian/Alaska Native	-
Asian	1.4
Black/African American	2.3

Student Characteristics	Percentage of Student Population
Hispanic/Latino	1.9
Native Hawaiian/Pacific Islander	-
Two or more races	5.2
White	89.2
Students eligible for free and reduced-price meals	48.1
Limited English proficient students	0.0
Students with special needs	16.7

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

Bel Air experiences both the advantages and disadvantages of being a small school. The small size promotes an environment of collaboration and community, and there is genuine collegiality and support among the staff. At the same time, the small size of the school means fewer support personnel resources. For example, there is only one reading intervention teacher and one special education teacher.

Bel Air Elementary was a high-performing school between 2007 and 2014.[11] This case investigates how Bel Air Elementary has produced such strong student performance results. It draws from interviews conducted in January 2015 with the principal, 14 teachers, and the school counselor. Information was also collected from the school website, the School Improvement Plan, and other documents provided by the principal, including the daily instructional schedule, school staffing list, and sample curriculum materials.

The case has 11 sections: 1) school performance, 2) school staffing, 3) school goals, 4) school schedule and collaborative planning time, 5) curriculum and instructional program, 6) assessments, 7) extra help for students at risk of academic failure, 8) professional development, 9) school culture and leadership, 10) summary and challenges, and 11) the degree of alignment between the school's strategies and the school improvement strategies embedded in the EB Funding Model.

School Performance

Table 3 shows the composite data used to select Bel Air Elementary for this case study. The percentage of students who are proficient or advanced across all subjects (reading and math in grades three through five, and science in grade five) was averaged to produce a number – percent proficient/advanced – for each year from 2007 to 2012. For 2013 and 2014, only scores for "All

[11] Maryland Report Card. http://www.mdreportcard.org/index.aspx?K=010702

Students" were available. During this latter two-year period, the State's curriculum standards changed, but the test did not. Statewide test score results dropped over these two years. Schools that had a drop of less than one standard deviation were given preference for being included as a case study.

Bel Air students consistently performed well on Maryland's standardized assessments between 2007 and 2014, averaging between 93 percent proficient or above in 2009 to 98 percent proficient in 2012. Subgroups of special education and FRPM students are no exception, achieving a proficiency rate greater than 90 percent in most years.

Table 3
Bel Air Elementary School Performance, Maryland School Assessment (MSA), 2007-2014

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	94	97	95	93	97	98	95	90
Free and Reduced-Price Meals (FRPM) Students	93	94	92	87	96	98	NA	NA
Limited English Language Proficient (LEP) Students	-	-	-	-	-	-	NA	NA
Special Education Students	89	80	93	86	95	95	NA	NA
Non-White, Non-Asian Students	-	-	-	-	-	-	NA	NA

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

School Staffing

Table 4 shows the school's staff. The administrative staff at Bel Air includes the principal, school counselor, and the secretary.

Table 4
Staffing in Bel Air Elementary School

Category	FTE
Administration	
Principal	1.0
Clerical	1.0
Prekindergarten Program	
Licensed Teachers	0.5

Category	FTE
Instructional aides	1.0
Main Program	
Core Teachers	10
Elective Teachers: 1 Librarian/Media, .7 Music, .4 Art, .4 Physical Education	2.5
Special Education	1.0
Reading Intervention	1.0
Aides	
Instructional Assistant – Kindergarten	1.0
Instructional Assistants – Special Education	2.0
Pupil Support	
Licensed	
School Counselor	1.0
Nurse	1.0
Non-licensed	
Custodial Staff	3.0
Lunchroom Staff	4.0

Bel Air has 10 full-time core teachers who teach kindergarten through grade five classes and are responsible for content area instruction in math, reading, writing, science, and social studies. There is also one full-time special education teacher and one full-time reading intervention teacher who works primarily with kindergarten through grade three students. The school has four part-time elective teachers – physical education (.4), art (.4), and music (.3 and .4) and a full-time media specialist (also an elective position) who serves as the librarian, technology teacher, and gifted education teacher. Students have one elective each day: library, media, art, music, or physical education. In the 330 minutes of daily instructional time, elective teachers provide 45 minutes (13.6 percent) of instruction (including transition time) and classroom teachers provide the other 285 minutes (86.4 percent). Teachers have planning time while their students are with the elective teachers. A standard formula for the number of elective teachers is to have the number of elective teachers equal to 20 percent of the number of core teachers, which would equal two positions for this school (0.2 x 10). The total at Bel Air is 2.5.

A certified teacher teaches the afternoon prekindergarten program at Bel Air. This year, because of the large class size (23 students), two instructional aides assist in the prekindergarten classroom. When prekindergarten enrollment exceeds the district's recommended class size, the district decides whether a school will receive an additional classroom aid or a second class.

Teachers reported a high level of loyalty to and satisfaction with teaching at Bel Air Elementary. The teacher turnover rate is very low. Over half of the interviewed teachers have been teaching at the

school for 10 years or more. This stable staff contributes to a sense of community and facilitates teamwork. The staff is close-knit and supportive of each other. They reported having frequent informal conversations about students, lessons, and curriculum. In addition, the teachers noted the strong support they receive from their principal, who they say has high expectations and encourages them in maintaining a standard of excellence. The principal's expectation is that every teacher is also a learner and is continually improving his or her practice. Teachers are expected to collect data and use them to inform instruction, differentiate to meet the needs of every student, design and meet student learning objective (SLO) targets, and implement relevant and effective instructional strategies.

The support staff and specialists are important parts of the school community as well. One full-time instructional aide supports the kindergarten classes, and there are two full-time special education instructional aides, one of whom works specifically with an individual student.

The small support staff at the school is scheduled carefully to meet the needs of students. The kindergarten aide moves between the two kindergarten classes, which share a large open-space classroom area. The special education teacher and instructional aide construct a schedule to ensure they are in each classroom as needed to provide support to special education students. They also work with those students who, while not officially identified as special education, have learning challenges. This year, students identified for special services are grouped in one classroom per grade (except for speech-support students) so that the special education staff can provide the necessary support. The reading intervention teacher works with small groups of students and assists teachers with assessment and intervention. In addition, both the principal and the school counselor work daily with small groups of reading students to provide extra support. Time built into the schedule provides a common time for grade-level teachers to plan together and work with specialists.

Ten years ago, Allegany District provided a school counselor for every elementary school. The school counselor plays a central role in building a positive school culture, supporting students and staff members alike. At Bel Air, the counselor teaches classes every day[12] on topics ranging from personal and emotional skills, to study habits and test-taking skills, to career awareness. The counselor's flexible schedule allows her to add lessons if a class-wide issue arises. She also works with small groups of students to discuss behavior-related topics such as fairness and anger management. These groups change frequently, and she tries to include every student in a group at least once between grades two and five. The school counselor also supports the principal in discipline matters, attends individualized education program (IEP) and parent meetings, and serves as the testing coordinator.

[12] Teachers typically have student-free time for planning or meetings when the school counselor is teaching their classes. Although the counselor has a regular schedule of classes, which is created with teacher input, she is not considered an elective teacher because there is no substitute provided when she is out of the building or in meetings.

Some support staff are shared with other schools in the district. Reading and math specialists visit Bel Air once or twice per month to deliver professional development, share resources, and discuss curricula with teachers. A pupil personnel worker spends one day per week in the school to address attendance, outreach, and family-related issues, and the district provides an occupational therapist, speech pathologist, and school psychologist as needed.

Bel Air Elementary is a Professional Development School (PDS) for Frostburg University. The school regularly hosts interns for field experiences and full-time student teaching. This is a mutually beneficial partnership, as the school's efforts to reach every student are enhanced by having extra educators in the classroom, and interns can learn a great deal about effective practices and professionalism from the experienced Bel Air staff.

While staff members have successfully helped students achieve high outcomes, they expressed concern about increasing workloads, the changing demographic characteristics of their student body, increasing student mobility, and additional assessment and evaluation demands. As the number of FRPM students and the number of students with behavioral and mental health issues increases, the staff anticipates challenges and the need for more personnel to meet students' needs.

School Goals

Bel Air's school goals for the 2014-15 school year focus on improving performance of special education and FRPM students. The principal has also set goals for improving proficiency rates for grade five science and for increasing writing proficiency in grades three and four.

Writing has become integral to both school-wide and individual teacher goals. Every core teacher has a writing-related student learning objective (SLO). The school adopted the 6+1 Writing Traits program by Ruth Culham to create consistency and rigor in the writing curriculum across grade-levels. Bel Air adopted this program in 2012 and teachers participated in school-based learning communities and professional development. Since then, the program has been more widely implemented across the district, and the district has provided additional professional development. Part of the motivation to focus strategically on writing came from the increased emphasis on writing under the Maryland College and Career-Ready Standards (MCCRS). Bel Air's early implementation of the 6+1 Writing Traits program demonstrates the innovative and proactive stance of the principal and teachers.

There is a school-wide theme of reaching excellence, which means doing one's best in every way. When the current principal came to the school eight years ago, Bel Air Elementary lacked a vision. Under her leadership, the staff developed the theme of a School Centered on Reaching Excellence (S.C.O.R.E.), and since then, this vision has influenced teachers, students, and community members as it is woven into curricular, extra-curricular, and professional development activities. Teachers discuss the meaning of excellence with their students, and school activities are designed to explore and promote excellence.

The key to reaching excellence is making sure students know what is expected of them and providing the supports they need to reach their goals. The school also recognizes students for doing well. For example, an Eagle Board (the school's mascot is an eagle) displayed "feathers" that faculty, staff, and students earned when they demonstrated excellence (i.e. through positive actions or words, academic achievement, good citizenship, etc.). The principal noted that such incentive programs are designed to make students know that their actions matter and that they are cared for. The Reaching Excellence mission is not only a school goal; it is part of the day-to-day character of the school that contributes to the warm and purposeful community environment.

School Schedule and Collaborative Planning Time

The 390-minute day is organized as described in Table 5.

Table 5
Daily Distribution of School Day at Bel Air Elementary School

Class or Activity	Kindergarten	Grades 1-3	Grades 4-5
Language Arts	120	120	120
Mathematics	40	60	70
Science/Health/Social Studies	40	45	60
Spelling/Handwriting	-	25	-
Intervention/Enrichment	30	30	30
Literature	10	10	10
Morning Meeting	20	-	-
Centers	30	-	-
Resource (Elective) Classes	40	40	40
Lunch/ Recess	60	60	60

The teacher workday is 8:10 a.m. to 3:40 p.m. Students may arrive at 8:15 for an optional breakfast. The school day begins with announcements at 8:50 and ends with dismissal at 3:20.

Core teachers provide instruction for five of these six-and-a-half hours. In addition, core teachers perform lunch or recess duty twice each week. In addition to teaching their content areas, elective teachers assist with lunch or recess duty once each week.

All teachers have daily planning time, common to grade-levels, while students attend electives, and additional student-free time in the morning (8:10 to 8:40) and during lunch or recess when they are not on duty. This time can be used for individual or grade-level planning, planning with specialists (such as the district reading or math specialist or the school's reading intervention teacher), and principal-led meetings. For example, the special education teacher plans with a different grade-level team each morning, and the principal holds grade-level meetings bi-weekly. Teachers reported that these regular times for collaborative planning and formal and informal discussions about students and curriculum are

critical to creating a sense of community and to supporting each student's success. Teachers use planning time to share ideas and resources, review data, and to discuss student progress and needs. However, teachers also noted a need for more time to explore new resources, particularly online resources, and curriculum materials provided by the district, school, or specialists. As they continue to adapt to the new Common Core curriculum, teachers feel pressed for time to identify and explore fully the supplemental instructional resources to support the implementation of the new curriculum and to prepare students for new assessments.

Curriculum and Instructional Program

Bel Air Elementary teachers follow the Allegany County Public Schools (ACPS) curriculum. ACPS revised the reading and math curricula to align them with the MCCRS, and the district was in the process of developing a new science curriculum at the time of the site visit. The principal and teachers noted the flexibility the district provides them in selecting supplemental resources to meet the instructional needs of students; the principal said teachers are encouraged to branch out to find resources to enhance the curriculum. The district's reading and math specialists have helped teachers learn the new curriculum, and the state-sponsored CCSS Summer Academy workshops provided additional professional development opportunities.

Instruction at Bel Air is data-driven. Teachers continually monitor reading and math progress with classroom assessments and quarterly district benchmark assessments. They review data with the reading intervention teacher, grade-level teachers, and the principal, and use results to group students and inform instruction. The principal noted a need for assessments that align with the new PARCC tests, and teachers anticipate some challenges during the transition to PARCC, both because of the online format, which will be new to students, and because of the lack of benchmarks to help with preparation.

Reading

Distinguishing features of the reading program are the use of a variety of curriculum materials, a focus on individual learning needs, early intervention, and flexible grouping practices. These practices are supported by targeted professional development on strategies to differentiate instruction and common planning times when teachers can work with the special education teacher, the reading specialist, and other grade-level teachers to review data, reorganize groups, and plan targeted instruction. Small class sizes facilitate the ability of teachers to provide instruction tailored to individual student learning needs. Writing and reading are integrated across subjects, with teachers using the 6+1 Writing Traits program described above.

Curriculum Materials and Individualized Instruction

The school-wide reading curriculum is based on *Houghton Mifflin Reading*, which incorporates Leveled Readers by Irene Fountas, anthologies for reading groups, and a variety of supplemental resources for supporting readers at all levels. Although this series provides the core for the reading curriculum, the

principal emphasized that reading instruction focuses on finding a way to help each student become a more proficient reader.

To supplement the district's curricular materials, teachers seek additional resources, often recommended by the district's reading specialist, to individualize reading instruction and support all learners. For example, the staff worked together to fund and create homemade "whisper phones," phone-like devices that allow students to hear themselves read aloud without disturbing the rest of the class. Teachers also draw on their knowledge of students and assessment data to select texts that are both developmentally appropriate and engaging for groups and individual students. Teachers noted that the small class size in the early grades is key to their ability to meet the needs of each student.

Early Intervention

Early intervention is critical to helping all students become proficient readers, so Bel Air directs resources to supporting kindergarten through grade three students who need extra help in reading. Students who are identified for reading intervention receive daily pull-out, small group support with the reading intervention teacher. These groups are comprised primarily of kindergarten to grade three students, but sometimes grade four students are included based on need. Reading intervention curricula include Wilson's Foundations, a phonemic awareness, phonics, and spelling program; Early Reading Intervention (ERI), a letter-sounds review used mostly in kindergarten; and Voyager, an intensive study of first sounds. A trained instructional aide assists with students placed in Voyager groups. The reading intervention teacher meets regularly with classroom teachers to align their goals for each student and to review data.

Flexible Grouping

Small flexible groups are also a key element in building the reading success of Bel Air students. The reading block includes whole group instruction followed by small group instruction and independent reading time. The reading intervention teacher and the classroom teachers use DIBELS (Dynamic Indicators of Basic Early Literacy Skills) reading assessments to assess students and create reading groups. Teachers provide input into the placement of students, and groups are flexible, so students can move in and out of groups or to different groups as they progress or need more support. Students are grouped with peers with similar reading levels and instruction and materials are tailored to each group's needs. In order to provide additional support for reading groups, the principal and counselor each lead a daily small group in the grade three classes. The special education teacher and the special education instructional aide provide additional individual and small group reading support in classrooms with students with IEP in reading.

Math

As with the reading program, the math program at Bel Air focuses on meeting the needs of individual students. Key strategies include integrating a variety of curriculum materials and instructional

approaches that are customized and adjusted for individual learning needs. The experience of the staff and the small class sizes contribute to the teachers' ability to differentiate and support all students.

Curriculum Materials

The ACPS elementary math curriculum is based on Pearson's enVisionMATH program and textbook series. Teachers reported using the core textbook as a resource rather than the central part of their math planning and teaching. District administrators and the principal have encouraged teachers to go beyond the textbook and find resources that address MCCRS. Teachers noted that teaching the new standards is quite different than the traditional skills-based curriculum used under the previous standards. In order to accommodate the change, teachers seek out and develop cross-curricular lessons that encourage problem solving and critical thinking. In addition, teachers integrate Number Talks, a district initiative, into their daily instruction. These mini-lessons help student think through and articulate problem solving, use math vocabulary, and increase math literacy. Teachers reported a positive impact on students' learning since implementing Number Talks.

Individualized Instruction

Bel Air teachers have received professional development in Universal Design for Learning (UDL), which emphasizes strategies for identifying the needs of individual students and tailoring instruction to those needs. Teachers spoke extensively about the strategies they use to differentiate math instruction, including using flexible small groups and Choice Board. Upper grade-level teachers described using peer tutors to help provide individualized support. All teachers integrate a variety of online, subscription-based math resources such as IXL and Sokikom, personalized math programs that align with MCCRS and help scaffold students toward more and more rigorous problem-solving skills. The teachers reported that these programs engage students in learning and have helped improve student performance. The programs also produce individualized progress reports, which teachers use to monitor growth and inform instruction. While these online resources have proven beneficial, the school cannot afford individual subscriptions for each student, which would allow students to continue their work at home. Teachers must be creative in how they use their limited subscription numbers so that students receive the support they need.

Science

Bel Air uses a science textbook from McGraw Hill, but at the time of the site visit, there was no district science curriculum. ACPS is developing a curriculum guide that will align with Next Generation Science Standards. For now, teachers work to integrate science into reading and math lessons through informational texts and inquiry activities. Emphasis is placed on cross-curricular lessons, including connecting the content in elective classes to what students are learning in their regular classroom. For example, the physical education teacher incorporates a science, technology, engineering, and mathematics (STEM) vocabulary word, such as velocity or force, into every lesson.

One of the principal's SLOs for 2014-15 was to increase science proficiency among students in grade five. In order to improve performance, special education and FRPM subgroups receive small-group instruction on the testing technology. Teachers will focus on UDL strategies for science lessons to meet the needs of all learners, and STEM lessons will continue to be emphasized in the grade five curriculum.

Assessments

Bel Air uses a variety of state, district, and school/classroom-based assessments to monitor student progress and identify individual learning needs. There are district-wide, quarterly benchmark tests in reading and math, and science benchmark tests for grade five students. Data from these tests are supplemented with classroom-based assessments, which inform instruction and instructional grouping in math and reading. As mentioned above, the school is preparing for the transition to the PARCC tests this year (2014-15). While there are concerns about the online format and the unfamiliar nature of the content and structures of the exams, teachers noted that they have been working hard to prepare students for the PARCC tests by familiarizing them with the technology and by implementing lessons that align with MCCRS.

Teachers regularly review data from standardized and classroom-based assessments. The principal leads grade-level and school-wide meetings to discuss data and compare Bel Air data with other district schools. These school-level data inform professional development and School Improvement Goals. Teachers meet with grade-level teams and specialists to discuss class and individual student data produced by district assessments. These data, along with classroom data, inform lesson planning and grouping strategies. Teachers also use these data to develop their SLOs, which require a pre-conference, mid-point conference, and a post-conference with the principal to discuss student performance data.

Looking forward, teachers voiced apprehension about how students would perform on the PARCC tests this year (spring 2015), since the assessments are new and the online format will be a change for students. Also, they noted that there are few scientifically-based benchmark assessments to help inform instruction and measure how students are progressing towards PARCC readiness. Teachers have been adapting to the Common Core curriculum and working to prepare each student for success, but many unknowns remain as the PARCC test is rolled out this year.

Extra Help Strategies for Students at Risk of Academic Failure

Bel Air teachers place great emphasis on meeting the needs of every student and providing extra support for students at risk of academic failure. Each teacher uses UDL principles to differentiate learning, a process that is made more effective because of the small class sizes and enhanced by an experienced staff. A variety of supports are available for students who need extra help.

Intervention teachers (reading and special education) provide support for students at risk of academic failure during the school day. Intervention teachers work closely with classroom teachers to identify learning needs, interventions tailored to those needs, and resources to support instruction. The school's

three full-time instructional aides work with individuals and small groups to provide additional help. Students at risk of academic failure are grouped for instruction according to their needs, and because groups are flexible, students can move into and out of groups as their instructional needs change. Grouping is facilitated by additional hands in the classroom, be it the principal, counselor, instructional aides, and even interns.

There are specific interventions in place for students who struggle with reading. The reading intervention teacher works with small groups of students in kindergarten to grade three to provide daily support. She uses programs such as Fundations, Voyager, and ERI (described above) to help students build strong foundations in phonics and literacy, and increase reading proficiency. Early intervention is an important part of this work, so the reading intervention teacher works closely with the classroom teachers to assess and monitor students in the early grades.

Supporting students who struggle in math is more challenging, since there are no math intervention teachers in ACPS. Teachers work with the special educator to meet IEP math requirements, and they use small group and individual instruction to help students at risk of academic failure. Online, personalized resources such as Sokikom and IXL (described above) were identified as key math support and enrichment strategies. Efforts have begun to do more parent outreach regarding math instruction. Many parents have expressed confusion or frustration with the new MCCRS math curriculum, so Bel Air staff and administration are reaching out through workshops and sending information home so parents are better able to support their children.

Families can take advantage of several local or district initiatives to receive additional academic support. There is a district-wide summer school program, but it is not held at Bel Air. The principal said that not many Bel Air students attend summer school. Some Bel Air students attend an after-school program at the local YMCA, where they receive homework help. This program is not affiliated with the public school, but it is a helpful resource for some families.

According to the principal, having the time to communicate and collaborate among the staff is key to supporting students. For example, the special education teacher plans each morning with different grade-level teachers. The principal explained, “We’ve had 100 percent of special education students passing. This is pretty amazing, given our limited staff and resources.” She said good communication is essential because classroom teachers must help in the work of meeting the IEP.

Many of the interviewed teachers also noted the importance of having time for communication and collaboration. Collaborative planning time as well as informal collaborations allow the staff to work as a team to solve problems and identify resources and strategies to meet students’ academic and social/emotional needs. The open design of the school and the small staff size were also conducive to communication and collaboration.

The principal foresees more students requiring extra help in math as curriculum and testing changes occur and the number of FRPM and special needs students increases. Meeting those needs will require more funding for personnel and resources.

Behavior and Attendance Support

Bel Air has a full-time school counselor who provides support for both students and teachers. She is the attendance coordinator, and calls the home of each absent student every day. She also meets with individual and small groups of students to develop interpersonal and personal skills. She also attends to any behavior, social and emotional issues they may have. This work contributes to the students' individual growth and helps them build positive relationships with peers and staff. She also works with teachers to develop behavior intervention plans and attends all IEP meetings when behavior is part of the plan. The counselor also serves as the testing coordinator and works with students on test-taking and study skills.

The principal noted an increase in the number of students requiring emotional, social, or behavioral support as student mobility increases and the demographic characteristics of the student body change. She anticipates a need for additional personnel and supports to adequately address these issues. For example, with the State's move to reduce suspensions, many schools rely on a Learning Assistance Room (LAP), staffed by an instructional aide, to address behavioral issues. Bel Air does not have these resources, or an assistant principal to assume responsibility for in-school behavioral interventions.

Professional Development

The school provides ample time for professional development. Professional development occurs formally and informally, according to the interviewed teachers, as teachers share and collaborate. Sometimes teacher-to-teacher professional development occurs formally during a school-wide or team meeting, when someone shares information about strategies he/she learned at a workshop. More often, though, such collaborative learning occurs during planning periods and between classes as teachers discuss challenges, seek advice, share strategies, and review data with one another.

The principal and school counselor serve as the instructional coaches at Bel Air. The SLO process has provided opportunities for individual coaching as the principal meets with each teacher to discuss goals and encourage rigorous data collection and analysis. The school also has cross-grade-level team leaders in math, STEM, and English Language Arts. These staff members attend district-sponsored training sessions and then deliver professional development (PD) to their colleagues at Bel Air. Time allotted during monthly faculty meetings and bi-weekly grade-level meetings allows teachers to share, learn, and discuss around specific topics and issues. The principal also seeks opportunities to have outside speakers provide training. Recently, they have had speakers from the local library and Frostburg University.

Teachers have opportunities to participate in district-wide professional learning communities with other elementary teachers and attend annual district-led PD sessions. The district often sets general guidelines

for school-based professional development, but the principal continually surveys her teachers to discover their needs and tailors professional development accordingly. In recent years, a lot of emphasis has been placed on identifying individual student needs, differentiation, and finding strategies and resources to help support a variety of learners. Several teachers mentioned the need for more time to fully explore and embrace the new curriculum changes and materials.

Teachers expressed concern that recently there has been more professional development time devoted to teacher evaluation preparation and other procedural matters. While they acknowledge the importance of these topics, they also noted that they have had less time to focus on curriculum and instruction topics during professional development sessions.

School Culture and Leadership

Bel Air is a school that balances professionalism, warmth, hard work, and fun. The school's open design allows voices and laughter to carry throughout the building in a way that is engaging but not distracting, setting a friendly and energetic tone. Teachers and parents work to make the school visually appealing with colorful bulletin boards and displays of student work. Evidence of learning and personal touches that capture the personality of the teachers and students can be seen everywhere.

Every staff member interviewed remarked about the positive relationships that exist between staff members. They said things such as, "We genuinely care about each other and about the students," "We have each other's back," and "We all work together. We really all get along." Such relationships set a positive tone in the school, and the teachers noted that students respond to this tone and act accordingly. It is also a welcoming environment for parents. Even bus drivers, cafeteria workers, and custodial staff are part of the family-like culture. Teachers and support staff tend to stay at the school for many years, deepening the sense of community. The close-knit, supportive, and positive staff relationships are certainly one of the school's greatest assets and an important, if intangible, element of its success.

Teachers report that students want to be in school, and records show high rates of attendance. The positive school culture and the supportive staff create an environment that is enjoyable for students and conducive to learning. The school counselor's work to address social, emotional, and interpersonal needs also helps build relationships and a positive environment. Teachers noted that students feel safe and cared for when they are at school.

Bel Air is also characterized by strong and caring leadership. Teachers noted that the principal has high expectations and holds them accountable, but she supports them in meeting these expectations. They feel like the principal understands their work and cares about them and the students. There is mutual respect, trust, and openness between the principal and staff.

The school's mission and vision of being a "School Centered on Reaching Excellence" undergirds the academic work and social interactions at the school. Hard work, respect, and care are openly

encouraged, modeled, and recognized as part of the excellence focus. Student learning and growth are taken seriously and assumed to be the shared responsibility of the administrators and teachers. Outreach efforts welcome parents to share in this work and provide encouragement and resources to help them.

In addition, Bel Air has small class sizes, a dedicated support staff, and strong parent involvement. These factors contribute to the school's success and students' high achievement levels.

Summary and Future Challenges

Bel Air has achieved impressive student achievement results. There are multiple, interrelated components that have led to the impressive results, including the following:

1. School-wide emphasis on meeting the needs of each student. Teachers use UDL strategies, flexible groups, and a variety of resource materials for differentiating instruction and engaging students. They regularly collect and review data and adjust instruction accordingly. Early intervention and ongoing monitoring have resulted in success for all students.
2. Small school and a homogenous student population.
3. Small class sizes. The average class size at Bel Air is 20 students. Small classes facilitate differentiation and small group instruction. Teachers are able to attend to each child.
4. Support personnel. The school support staff includes a special education teacher, reading intervention teacher, and instructional aides that address students' needs and facilitate small group instruction. These support staff members work closely with teachers to plan instructional interventions and assess student learning.
5. Time for collaboration and communication. Grade-level teachers share common planning times every day, and additional planning time before-school allows teachers to meet with others in the building. Formal collaboration occurs during common planning time, faculty meetings, and principal-led team meetings. Informal collaboration is continuous, occurring throughout the day and before and after school. Every teacher interviewed identified the school's collaborative culture as a critical part of its success.
6. Strong leadership. There is mutual respect between the principal and staff. The principal sets high expectations and provides abundant support to teachers. She understands the many demands on teachers' time, so is strategic in how she implements initiatives. She said, "I don't pressure them with 'busy work' or work not related to their students' learning." The principal gives teachers a great deal of independence and support in their teaching, and teachers respond with dedication and creativity.
7. Positive school culture. It is a place where students, teachers, and staff members want to be. There is a genuine sense of caring and support within the school, which is continually

strengthened by the proactive efforts of the principal and counselor. A school-wide emphasis on excellence sets high expectations for students and teachers.

The principal and staff have worked hard to achieve strong student achievement results. When asked about challenges that will affect continued improvement, they identified four things:

1 Changing student populations. Bel Air has seen an increase in the number of FRPMS students it enrolls, and also in the number of students who require emotional and behavioral support. The principal and staff anticipate that these patterns will continue based on the demographic changes in the district and community, and a district-wide economic downturn. Additional resources, both physical and in personnel, will be needed meet these needs.

2 Staffing. As a small school, Bel Air must maximize the staff available to them. The teachers that offer extra support (i.e. special education and reading intervention) are extremely busy each day. If the changing student population means that more students will need support, additional staff will be needed.

3 Financial Resources. Individualized instruction requires that teachers have access to a multitude of resources. Additional funding for resources such as universal subscriptions to online math programs like Sokikom would facilitate continuous improvement.

4 New initiatives, assessments, and curriculum. There are many unknowns related to the new PARCC tests, and teachers expressed concern about how best to prepare students. While they look forward to having the data from this first year of testing so they can begin shifting instruction as needed, there is a sense of anxiety about how the new exams will impact the students and the school. Teachers also noted that parents struggle to help their children with the new math curriculum. Overall, teachers felt they needed more time to learn and adjust to the many curricular, assessment, and evaluation initiatives that are being implemented.

Alignment with EB Model

The strategies and structures in place at Bel Air Elementary align with several aspects of the evidence-based model.

Areas of alignment include the following:

1. Clear measurable goals. School-wide goals and individual teacher goals relate to student performance. Data are used to measure progress.
2. Sufficient staffing. The school employs enough core teachers to keep class sizes fairly small and enough elective teachers to provide adequate student-free time for core teachers to plan and attend regular meetings.

3. Effective curriculum and instruction program. The district curriculum provides helpful structure, and teachers are encouraged to supplement and modify the curriculum as needed. A school-wide emphasis on UDL and differentiations addresses the needs of all learners. Kindergarten to grade three emphasizes learning reading basics including phonics.
4. Interventions for students at risk of academic failure. The reading specialist, along with classroom teachers, provides early intervention in reading through a variety of curricular programs and resources. A school-wide commitment to individualized instruction promotes success for all learners.
5. Collaboration. The small, close-knit staff regularly shares ideas and resources. Grade-level teams share common planning time each day. Specialists regularly consult with and/or co-plan with core teachers.
6. Strong leadership. The principal sets high expectations for teachers and provides the supports they need to reach their goals. There is mutual respect between the principal and teachers;
7. Deliberate and ongoing professional development. The principal at Bel Air surveys her staff to determine professional development needs. PD is provided at the district-level and also at the school-level.
8. Data-driven decision making. Teachers are trained and supported in using disaggregated data to inform instruction.
9. Accountability. Teachers and administrators work together to meet school and student needs. The principal meets regularly with each teacher to plan and discuss SLO goals.

Chapter III: Chadwick Elementary School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Executive Summary

Chadwick Elementary School is an example of the first category of schools – a high performing school. The case was developed through interviews of the principal and key teachers, and review of informal documents provided by the school principal and information on the school's curriculum and instructional program on the school's website. In fall 2014, Chadwick Elementary School in Baltimore County Public Schools enrolled 548 students in prekindergarten through grade five. The school is 98.5 percent minority (49 percent African American) and 80.5 percent free and reduce-priced meal. In 2014, 97 percent of its students performed at or above proficiency in reading, math and science.

Chadwick is a highly collaborative and data-driven school, with a skilled and effective faculty. Nearly everyone interviewed said they develop lesson plans, provide differentiated instruction, and evaluate results based on data.

The seven key factors behind the school's results were:

1. Smart and capable teachers. The principal spends hours recruiting teachers, interviewing and observing them, developing them after they are hired, and working hard to retain them. The goal is to equip every teacher with the skills needed to tailor the reading, math, and science curriculum to the needs and interests of the students in the school.

2. Small class sizes. With a school-wide average class size of 21 students, Chadwick creates an environment where teachers can work with groups of seven or fewer students in their classrooms. Small class sizes also enable core teachers and several push-in teachers to provide the extra help many students need to achieve to proficiency levels.

3. Strong leadership. As most teachers put it, the principal is "tough and understanding." The principal has high expectations for teacher performance and provides a great deal of support. The principal is strict but gives teachers independence; teachers have the freedom to make lessons more creative, to link the issues and topics to student interests, and to make learning interesting. The principal holds teachers accountable for student performance (irrespective of socioeconomic background) and for keeping pace with the curriculum to ensure that all units are taught to all student groups each year.

4. Collaborative culture. Collaboration occurs all the time at all grade-levels through grade-level teams. The school has a strong collaborative culture, with multiple forms of both formal and informal collaborations. Nearly everything in the school is done collaboratively, including elective and extra help teachers.

5. Commitment to the school and to ALL students. Chadwick teachers are not just concerned with students in their classes or grades, but with students across the entire school. Teachers see the school's students as students, not as LEP, FRPM, minority, immigrant, or any other category. They are just students with different needs, all of whom can benefit from differentiated instruction.
6. Multiple interventions. Interventions provide extra help for students beginning in prekindergarten, then continuing with extra help push-ins in kindergarten through grade five classrooms and small groups. Interventions are designed to ensure that no student falls behind.
7. Accountability for results. For everyone in the school – teachers, administrators, and students – accountability for results is the mantra. When issues emerge, teachers go back to the drawing board and change the curriculum and instructional approach to improve results for the next year. The school is relentless in its mission to educate every student to a performance level that is proficient or higher.

The case concludes that the overall strategies used by Chadwick to produce its high level of performance are aligned with the improvement system embedded within the evidence-based (EB) model, and do not require any changes in the EB model to reflect specific differences in how this school produced its high level of performance.

Introduction

Set in a working-class community in the Baltimore County Public School district, Chadwick Elementary School is about 13 miles west of downtown Baltimore, just off Route 695. In fall 2014, Chadwick enrolled 548 students in prekindergarten through grade five. Chadwick is a high performing school with 97 percent of its students achieving at or above proficiency in a composite math, reading, and science score. Overall, Chadwick is highly collaborative school, with a skilled and effective faculty. It is a data-driven school with nearly all those interviewed saying they develop lesson plans, provide differentiated instruction, and evaluate results based on student performance data. Class sizes averaged 21 students, with the following average class sizes by grade-level presented in Table 1:

Table 1
Chadwick Elementary School Class Sizes

Grade-Level	Class Size
Prekindergarten (2 classes)	20
Kindergarten (5 classes)	18
One (4 classes)	21.5
Two (4 classes)	23
Three (3.5 classes)	22
Four (3.5 classes)	25
Five (4 classes)	20

There were five sections of kindergarten classes and four sections for each grade one through five. Grades three, four, and five also had combination sections, grouping grades three and four, and grades four and five. The school has two half-day prekindergarten programs with 20 students in each class. All students walk to school. The campus is surrounded by modest, split-level homes; however, the principal explained that the vast majority of students live in apartment buildings a few blocks away. Many apartments house multifamily and even multi-generational Asian, Hispanic, or African American families.

The school is 98.5 percent minority, with African Americans comprising 49 percent of students, Asians 34 percent, and Hispanics 11 percent, though the latter demographic is growing. Students come from 13 different countries and speak 18 different home languages. The majority of Asian students are from India, Pakistan, Nepal, and Vietnam, and many members of Asian family households held professional jobs in their native countries. A large number of the students are from Muslim families, and many of these families attend a local mosque. There are many multiracial students.

A large majority of students, 80.5 percent, are FRPM eligible compared to a state average of about half that, and the district average of 48 percent. LEP students comprise 21.1 percent of students and, according to the principal and many teachers, this percentage will probably rise as the Hispanic population grows, as many are from immigrant families who do not speak English. Students receiving special education services make up 8.9 percent of all students, compared to a statewide figure of 12 percent.

Chadwick Elementary has been a high-performing school for the past several years. More than 95 percent of students consistently perform at or above proficiency level in math, reading and science on state tests, and Chadwick even reaches 100 percent proficiency in some subjects and grade-levels (e.g. math in 2012). This case investigates how Chadwick has produced such results.

The case has 11 sections: 1) school performance, 2) school staffing, 3) goals, 4) school schedule and teacher teaming, 5) curriculum and instructional program, 6) assessments, 7) extra help strategies for students at risk of academic failure, including special education services for children with moderate and mild disabilities, 8) professional development, 9) school culture and leadership, 10) summary, and 11) the degree of alignment between the school's strategies and the school improvement strategies embedded in the EB funding model.

School Performance

Table 2 shows the composite data used to select Chadwick Elementary for a case study. The percentage of students who are proficient or advanced across all subjects (reading and math in grades three through five, and science in grade five) was averaged to produce a number – percent proficient/ advanced – for each year from 2007 to 2012. For 2013 and 2014, only the "All Students" results are presented. During this latter two-year period, Maryland's curriculum standards changed, but the test did

not, which led to a drop in statewide test results. Schools that had a drop of less than one standard deviation between 2012 and 2014 were given preference for being included as a case study. Chadwick's composite test scores did not drop for these two years, but remained high at 96 percent in 2013 and 97 percent in 2014.

Table 2
Chadwick Elementary School Performance, Maryland School Assessment (MSA), 2007-2014

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	84	92	94	93	94	95	96	97
Free and Reduced-Price Meals (FRPM) Students	83	90	96	92	94	96	NA	NA
LEP Students	17	74	89	96	88	100	NA	NA
Special Education Students	33	-	95	86	88	88	NA	NA
Non-White/ Non-Asian Students	85	92	95	92	92	94	NA	NA

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

Table 2 demonstrate the effectiveness of this school. In 2012, on average 95 percent of all students scored at or above proficiency on the math, reading, and science composite score. The results for students from backgrounds of poverty, defined here as FRPM students, was 96 percent proficient or advanced. The result for LEP students was 100 percent, and the result for non-Asian minority (mainly African-American and Hispanic) students was 94 percent. Demographics had virtually no impact on student performance at Chadwick Elementary School. Regardless of race, home language, immigrant status, or socioeconomic status, 95 out of 100 students were proficient across reading, mathematics, and science. Eighty-eight percent of students with individualized education programs (IEPs) scored at or above proficiency.[13]

This case describes how Chadwick produced such results. It draws from interviews with the principal and eight teachers, and from several documents, some provided by the principal and others drawn from the

[13] More details on Chadwick student performance can be found at: http://www.mdreportcard.org/Entity.aspx?k=030113

school's website. The principal provided PowerPoint presentations on several issues, including, for example, the school's improvement plan, its approach to "learner-centered instruction," and its reading program. The website provided information on the school's curriculum and instructional program, as well as its after-school programs.

School Staffing

Staffing classrooms with top quality teachers is a prime strategy for Chadwick. When asked how the school produced its student performance results, the first thing the principal said was, "We hire only the best teachers; we find top talent and we keep it. We hire smart people, work with them over the summer, and provide them the assistance they need to be successful throughout the school year." Teachers backed up this claim, with one replying, "teacher talent – cubed!"

Teachers also work in what teachers call tightly knit, grade-level teacher teams, which helps provide them with support from peers throughout the year. Over time, this practice also has led to a very stable staff, so the school provides continuity of effective instruction in every class, every year.

Further, according to the principal and the teachers, the school seeks to place the most effective teachers in the classrooms and with the students and student groups that need the most help.

The school also values content specialization in its staff. The principal has an advanced degree in reading from Johns Hopkins University and has developed several segments of the school's reading program. Several teachers in the early elementary grades have graduate degrees in reading. At the upper elementary grades, rather than grade-level teachers providing instruction in all subjects, the school has some teachers providing instruction in just one subject. The school calls this "departmentalization" for reading and math. In grades four and five, only a math resource teacher teaches mathematics, and only a reading resource teacher teaches reading.

Table 3 shows the school's staff by full-time equivalent (FTE) position. Administration consists of a principal, an assistant principal, and two secretaries in the central office.

Table 3
Staffing in Chadwick Elementary School

Category	FTE
Administration	
Principal	1.0
Assistant Principal	1.0
Clerical	2.0
Prekindergarten Program	
Licensed Teachers	1.0
Instructional Aide	1.0
Prekindergarten Parent Helper	1.0
Main Program	
Core Teachers	24.2
Elective Teachers: 1.4 Music, 1 Art, 1 PE, 0.8 Tech	4.2
Instructional Coaches: 0.5 Math, 0.5 Tech, 0.5 Reading	1.5
Special Education Self-Contained (Severe and Profound)	1.0
Special Education (Mild and Moderate)	1.5
LEP teachers	1.5
Tutors/Tier 2 Interventionists: 1 Each, Reading and Math Resource Teachers	2.0
Librarian	1.0
Aides	
Instructional: Title I	1.0
Special Education Self-Contained (Personal Assistant for Child with Visual and Physical Disabilities)	1.0
Special Education, Inclusion	2.0
Pupil Support	
Licensed	
Guidance Counselor	1.0
Nurse	1.0
Psychologist	0.4
Occupational Therapist	0.4
Physical Therapist	0.2
Non-licensed	
Behavioral Specialist	1.0
Lunchroom Staff: 1 Manager and 3 Assistants	4.0

The school has a prekindergarten program that includes 40 students – 20 in a morning program and 20 in an afternoon program. One prekindergarten teacher and one prekindergarten aide provide program instruction. The teacher and aide also get support from a paraprofessional, who works with parents of

prekindergarten students. Thus, a large number of the school's students have access to prekindergarten before they enter the regular elementary program.

The staffing configuration of the school shows the importance of the Chadwick's reliance on effective core teachers. Table 3 shows that the school has 24.2 core teacher positions for 508 students in kindergarten through grade five. Core teachers are the grade-level teachers who teach reading, math, science, and social studies. For kindergarten through grade five, this staffing equates to an average class size of approximately 21 students. However, as noted above, average grade-level class sizes vary from 18 in kindergarten to 25 in grade four, with other grades in the low 20s. The principal said she uses a significant portion of the school's Title I funds to hire three core, grade-level, classroom teachers to help keep class sizes low. (Most teachers interviewed stated that "small class size," their words, was one of the key factors behind the school's effectiveness).

The school also employs "elective," or "specials" teachers to provide instruction in art, music, physical education, library, and technology. The number of teachers who provide this instruction – 4.2, including the librarian who teaches some of the specials class sections – is in line with the school having teachers instruct for five of six hours of daily student instruction. A typical staffing standard, and the EB model formula, for the number of specials teachers would be to have 20 percent specials/elective teachers above the total number of core teachers, which would equal 4.8 positions for this school (0.2 x 24.2).

When asked about instructional coaches, the principal said that she and a grade four math expert teacher acted as the school's instructional coaches. The assistant principal does the bulk of school management. However, some portion of the school's math, reading, LEP, and technology resource teachers also provide mentoring or instructional coaching. Table 3 above shows 1.5 instructional coaching positions in addition to the principal (who is counted only once in the principal line, even though the principal provides coaching services).

The school has several categories of extra help staff. The school has 1.5 LEP teaching positions for its approximately 110 LEP students. Chadwick has two Tier 2 intervention staff consisting of one math resource teacher and one reading resource teacher. Both of these teachers spend most of their time in classrooms giving students extra help with instruction.[14] Chadwick has 1.5 teaching positions for students with mild and moderate disabilities, and one teacher with a self-contained classroom of seven children with more severe disabilities.

[14] Tier 1 and Tier 2 interventions are used in the Response to Intervention framework. Tier 1 is core instruction and also includes accommodations and extra help provided by the regular classroom teacher. Tier 2 includes additional instructional support or attention beyond that provided by the regular teacher, but before a student is identified as having a disability and provided an IEP. Tier 3 consists of special education services.

The school has three paraprofessionals providing instruction. Two paraprofessionals are special education inclusion individuals and one is funded by Title I dollars. Two of these three instructional aides have teaching licenses, but work at the salaries of instructional aides. It could be argued that the school has only one non-licensed, paraprofessional instructional aide, an atypically low number for a school of Chadwick's size and student demographics. In addition to the three instructional aides, the school also has an aide who provides all-day assistance to one student with visual and physical disabilities.

These modest numbers of extra help staff bolster the school's claim that much of its success derives from the instructional effectiveness of its core teachers along with multiple early interventions.

The school has a full coterie of pupil support staff, including one guidance counselor, one nurse, and one position split among three individuals who provide speech/language, occupational, and physical therapy. There is also a paraprofessional providing family outreach and parent support for the regular school program.

School Goals

The school goal has been to educate 100 percent of students to proficiency in the Maryland College and Career-Ready Standards (MCCRS). It is close to this goal with 97 percent of students proficient. Several subcategories of students (e.g. LEP) or subjects (e.g. math) actually met the 100 percent goal. For example, in 2012, 100 percent of grade four students scored at or above proficiency in mathematics.

Over the years, the school has launched several programmatic initiatives to attain this aggressive goal of total proficiency. Most of these initiatives will be discussed below in various sections of the case. The prime performance goal has been, and continues to be, having all students learn to proficiency.

The principal and nearly every teacher interviewed articulated this goal. Nearly all teachers said they are held accountable for student achievement to the State's proficiency standards. As a result, they gear their instruction to attain these proficiency goals for all students. The school also holds teachers accountable for curriculum pacing to ensure that all classrooms cover the major curriculum units included in Maryland's state standards for math and reading. The assumption is that all curriculum standards must be taught and learned in order for students to be successful on state tests.

The school has also prepared itself to change requirements according to the MCCRS in reading and math. Both the principal and many teachers expressed an awareness of Common Core curriculum and were beginning to incorporate elements of the MCCRS into their curriculum and instructional practices (e.g. reading informational texts and placing stronger emphasis on problem solving in mathematics).

Chadwick wants to set a goal of having all students perform to proficiency on the new PARCC tests that are aligned to the Common Core and the new MCCRS. However, the school is concerned that its students might not perform as well as they have on the MSA because the new testing regime will be

primarily online. The school does not believe it has the computer resources necessary for all students to become adept at online test-taking, and fears that the new online format (not the new curriculum standards or new tests) may cause scores to drop.

School Schedule and Collaborative Teams

The staff works from 8:25 a.m. to 3:25 p.m., a full seven-hour school day. The principal often meets with various staff members before students arrive. The school doors open to children at 8:30, and the instructional day runs from 8:40 a.m. to 3:10 p.m. – a six-hour and 30-minute school day. Accounting for the 30-minute student and staff lunch period, Chadwick provides six hours of instruction for students.

Teachers provide instruction for five of these six hours. All teachers have 60 minutes of pupil-free time at some point during the day (50 minutes during which students receive instruction from elective or specials teachers and 10 minutes for transition to and from those classrooms). Importantly, all teachers at a grade-level have the same pupil-free time period. For example, all kindergarten teachers have pupil-free time from 9:50 to 10:40 daily while grade five teachers have pupil-free time from 10:50 to 11:40. Thus, there is time during the regular school day for grade-level teams to meet and collaborate on a daily basis.

During the pupil-free time for grade-level teachers, students rotate among art, instrumental and vocal music, physical education, technology, some library instruction, and extra help sessions provided by a resource teacher. Thus, in addition to the considerable time students have each day for reading (2.0-2.5 hours), math (1.0-1.5 hours), and science and social studies (averaging an hour a day combined), students also get exposure to a full liberal arts curriculum that includes music and art.

This schedule allows the school to create multiple teacher teams. The core teams are the grade-level teams, each of which includes four teachers (five for the kindergarten team). The principal appoints one teacher as team leader for each grade-level team. These teams meet weekly, both formally and informally. Several teachers stated that they interact with their grade-level colleagues before-school starts, after children leave, during the regular day, during pupil-free time, and also on the weekends. The seven-hour workday for teachers allows for flexible before- and after-school collaboration.

Each grade-level team also meets once a month with the principal, assistant principal, LEP and special education teachers, and sometimes with the math and reading resource teachers. The majority of the meetings are at least one hour. All-day meetings are planned for October and April. During these sessions, the group discusses overall grade-level performance, monitors the progress of students with IEPs, identifies adjustments to be made in the instructional program, regroups students within classrooms, structures the deployment of extra help teachers (LEP, special education inclusion, reading and math resource teachers, etc.) in various classrooms, and engages in specific, grade-level professional development. The principal hires substitute teachers for these all-day grade-level team meetings.

The school also has a leadership team comprised of the principal, assistant principal, grade-level team leaders, special education teacher, and LEP teacher. This team develops the school's formal goals and progress plan. This team assesses school-wide academic performance, conducts "root analyses" of problems identified through various test results, and devises school-wide solutions to these issues.

The assistant principal also leads a school support team comprised of the special education teachers, the reading and math resource teachers, the LEP teacher, and other teachers as needed. This team monitors students' academic progress, particularly for students with IEPs. The school support team also works with the IEP teams that develop student IEPs.

When asked what makes the school special, most teachers and the principal note the high level of collaboration among the staff, mentioning both formal and informal types of collaboration. Chadwick's various teams and groups help produce an unusually high level of teacher collaboration, most of it focused on making the curriculum and instructional programs more effective.

Curriculum and Instructional Program

Across the school, all teachers use a systemic, school-wide reading and math program. The principal and teachers said the reading and math curricula are now aligned to the MCCRS, including the curriculum standards developed by the district. Further, all teachers use two textbook series recently adopted in the Baltimore County Public Schools district: Reading Wonders and Math Investigations. Both of these textbook series are "Chadwickified," i.e. adapted and augmented with materials that more directly meet the specific needs and interests of Chadwick's students.

All classes in all grade-levels are taught the entire core reading and math curricula. Classes are organized heterogeneously in kindergarten through grade two, along with some flexible ability grouping in grades three through five. Further, in grades four and five one teacher provides instruction for all the math sections and a different teacher provides instruction for all the reading sections. In other words, the upper elementary grades are partially departmentalized.

The school also is developing instructional approaches that are learner-centered rather than teacher-centered. This is a strategy the faculty believes will help students learn the higher-level MCCRS. The goal for learner-centered instruction is for the teacher to facilitate the learner's active engagement in constructing his or her own knowledge. This sort of engagement happens when students ask critical questions and when they seek information from reading materials to answer those critical questions. Students can then present analyses backed by data and text evidence. Learner-centered instruction can also include collaborative work with other students. It requires learners to acquire information by comprehending what they read, evaluating and synthesizing findings, showing reasoning and use of evidence, and justifying concepts, claims, and conclusions. In mathematics, learner-centered instruction includes developing digital fluency, using mathematical knowledge to solve unique problems, and engaging in innovative problem solving in situations where there are multiple solutions to problems.

Reading

There is one structured and systemic reading program across the school. The core curriculum is McGraw-Hill's Reading Wonders. This textbook series was designed specifically for Common Core Reading/Language Arts standards. The publisher claims each component and lesson is designed for effective and efficient Common Core instruction. The program provides support for:

- Building a strong reading foundation;
- accessing complex text;
- finding and using textual evidence;
- engaging in collaborative conversations; and
- producing daily responsive writing stemming from new learning.

Chadwick's reading time block is a minimum of two hours. During that time, the teacher presents a whole class lesson for 30- to- 40 minutes. Students are then divided into three flexible groups: those students who need the most help, average learners, and more advanced students. Group size varies, but students who need the most help often have groups with the fewest students. Each group then works on three different activities: reflective journaling (writing), teacher instruction, and independent reading.

Reflective journaling is a daily informative assessment that incorporates material from reading, math, and science lessons. The teacher usually gives students a writing prompt for this activity.
The group working directly with the teacher focuses on specific skills and knowledge tailored to the group's needs. This is a time when the regular classroom teacher can provide extra help with specific knowledge and skills and when a math or reading resource teacher, LEP teacher, special education inclusion teacher, or aide can also provide extra help.

During guided independent reading, students select books from the classroom or school library that are both of interest to them individually and at their reading level.
In some classes, LEP and/or special education teachers provide additional reading support. These teachers sometimes work with a small group, with smaller subsets of various groups, or even with individual students depending on student needs. All supplemental help is related to the skills and knowledge being taught in whole-class lessons by the grade-level teacher.

The reading program emphasizes vocabulary development and comprehension in all grades, with an emphasis on phonics and reading fluency in kindergarten through grade two. A more extensive vocabulary and comprehension program is developed in grades three through five. Though all teachers use the district's reading program, they also substantially augment it with materials developed explicitly for the needs and interests of the students at Chadwick.

For the past several years, Chadwick has used a phonics program developed by its principal to address decoding patterns and a lengthy list of lookalike words (e.g. have, has, had, haven't). This program emphasizes visual and auditory patterns with the goal of having students learn to discriminate between the words they hear and see. The program works toward this goal using daily dictation of phrases and sentences. It is repetitive work with the goal of building solid decoding skills – the foundation for word recognition and early reading fluency. The principal also developed an assessment called the Hess Word ID, to work in tandem with the phonics program. Teachers use the Hess Word ID to monitor student progress and adapt activities, words, and phrases to respond to what their students have learned and what they still need to master. During the past two years, teachers have also begun implementing the Reading Wonders Program, which was purchased by Baltimore County Public Schools.

Teachers all stressed the importance of phonics in kindergarten and grade one, also noting that some children need additional phonics help in grades two and three.

The Chadwick reading program further addresses vocabulary skills with the goal of developing an extensive vocabulary for all students. Staff members believe this is especially important knowledge for students for whom English is a second language. Teachers help students develop vocabulary skills by teaching strategies such as using context clues (e.g. pictures or surrounding sentences). The school also has developed a Greek and Latin root program to teach students word roots. This foundational knowledge can be used to recognize and learn new vocabulary. Vocabulary development also addresses homonyms, antonyms, synonyms, prefixes, and suffixes, which can be quite helpful for LEP students and native speakers alike.

Chadwick addresses reading comprehension with a focused effort to teach multiple comprehension skills. The main reading textbook is supplemented with various "high interest" books, organized by classrooms and reading levels. The goal is to give all students access to books at their reading levels and within their areas of interest. In past years, teachers found that too many of the reading passages in textbook series were of low interest to students and made it hard to engage the students in reading. Adding leveled books to classroom libraries has helped students overcome this motivational challenge. This effort included stocking nonfiction books in math, science, and social studies subject areas, which helped broaden Chadwick's reading comprehension program to include informational texts as well as standard English texts. Today, Chadwick teachers provide instruction in reading comprehension using a mixture of fiction and nonfiction texts, a practice that is very much in line with the demands of Common Core English/Language Arts standards.

Chadwick also adopted the Comprehension Toolkit, a set of strategies developed by national reading experts Stephanie Harvey and Anne Goudvis. The Comprehension Toolkit helps teachers engage students in their own learning by asking questions such as, "What do you know? What do you think? How do you know?" Teachers then help students answer these comprehension questions using both

fiction and nonfiction books aligned with the student interests and reading levels. Underlying this approach is the assumption that one can teach reading skills with any set of books as long as there is expert teaching. Developing expert reading teachers is a hallmark of this school.

Finally, Chadwick has invested substantial time in having teachers engage students in "close reading." Close reading emphasizes using text analysis, reasoning, evidence, comprehension, evaluation, and synthesis to engage texts with increasing rigor. Though close reading started long before the implementation of the MCCRS, it still reflects one of the prime MCCRS reading standards that students will "read closely to determine what the text says explicitly and to make logical inferences from it, and cite specific textual evidence when writing or speaking to support conclusions from the text." According to Chadwick's principal and many teachers, such "evidence-based reading" helps students say or write some version of the following: "I know from my reading that [...]; I know this because of what I read on page [...]; the author stated […]." To help students engage in the process of evidence-based reading, teachers first focus on text-dependent questions that focus on details in the text. Then the teacher raises deeper questions about the text: "How do you know? Why did […]? What caused […]? What happened […]? What happened just before and after […]? How is this the same as […]? How is this different from […]?" The goal is to give students multiple skills and strategies to find evidence in the text and to then use that evidence for data-based conjectures, analyses, and conclusions.

Math

The math program follows Baltimore County Public Schools' math standards, which are linked to the MCCRS math standards. The district adopted the Math Investigations program, developed with National Science Foundation funding by TERC in Cambridge, Massachusetts. Pearson now publishes the Math Investigations series. All teachers in the school use this series. The content includes numbers and operations, geometry, data, measurement and early algebra, and automaticity for math facts. The goal is to address a set of core math topics in depth, with increasing depth and complexity each year as students move to higher grades.

The math program is a concept-based curriculum. Teachers have a "pacing guide" to help them cover all the units for a grade over a school year, but they also have some discretion in timing to ensure that previous concepts have been mastered before moving to a new unit.

The math block is between 60- and 90- minutes per day. After a whole class lesson of about 30 minutes, the class divides into three groups. During this time, the LEP teacher, special education inclusion teacher or aide, or math resource teacher usually assists the regular teacher. Again, because class sizes average 21, group sizes range from five to 10 with an average of seven. Nearly all teachers interviewed said these group sizes are small enough to allow for individualized assistance when needed.

As noted above, math is departmentalized in all of grade four and some of grade five, with one individual teaching all math sections, another teaching all reading sections, and a third teaching all science and social studies sections.

The "Chadwickifying" of the math program mainly comes through pedagogy. The goal is to teach math well, to teach it creatively, and to engage students in learning and problem solving. Chadwick makes significant efforts to make math relevant to students. One teacher incorporates football examples into the curriculum. This same teacher also brings in grocery store advertising flyers, gives students a budget, and asks them to make a set of purchases within the budget. This exercise can include sub-problems such as determining an item's cost when there is a buy-one-get-one or three-for-one sale. Another teacher has students write their own math problems. All teachers have students propose various solutions to math problems and defend these possible solutions during class discussions. A grade four teacher uses a character called Zero the Hero, who dresses in a costume and engages the class in various types of math problems and solution strategies.

In the lower grades, teachers work together to develop common math lesson plans, teach those lessons on the same days, and then reflect on the results. As noted below in the section on assessments, teacher teams also use assessments to review student results on common, end-of-unit tests. These test results help teachers identify the degree of mastery and the effectiveness of the unit by grade-level, classroom, and individual student.

Another feature of Chadwick math is that most teachers understand the expectations for students entering a grade, the learning required within that grade, and the learning expected at the next grade-level. For example, the current grade four math expert teacher has taught grade three math, and therefore, knows the material and the work needed to help students jump their math skills to proficiency in grade four. Similarly, the current grade five math teacher used to teach grade four math, and therefore, knows the material and the work needed to help students reach proficiency in grade five. Because there is considerable collaboration across grades, teachers can help ensure strong connections between the types of math instruction used across grade-levels.

Science

For kindergarten through second grade, science is integrated into reading and math blocks. There also is a 50-minute science block for kindergartners and a separate 45-minute science block for grade three students. Science is departmentalized for grades four and five where it is taught for about 50-minutes per day.

Advanced Instruction

Chadwick has had a gifted and talented program for several years and has gained recognition as a school with Excellence in Gifted and Talented Education (EGATE). The gifted and talented program was focused

on accelerated instruction until recently, when the district shifted its gifted and talented philosophy to one of enrichment rather than acceleration.

Additionally, beginning six years ago, Chadwick identified the 10 top readers in each kindergarten group and provided those students with accelerated reading instruction at every subsequent grade-level. These students are able to move through the material at a faster rate than other students. In spring 2015, the school will graduate its first class of these advanced readers.

Assessments

Chadwick makes use of multiple assessments, including the MSA (in past years), informal reading diagnostic tests, the Hess Word ID for phonics and spelling, the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), NWEA Measures of Academic Progress (MAP), formative assessments in both reading and math provided through the reading and math series purchased by the district, and common end-of-unit tests also provided through the core curriculum series.

MAP is a benchmark assessment administered online in September, January, and May. Because its results are provided the day after administration, faculty members get the MAP data in the fall before the MSA results. MAP is used to assess student needs at the beginning of the year and to set goals for the school, classrooms, and individual students. Recent results showed that in math, there were issues both with math facts and with problem solving. In response, the school adopted a math facts program called Fast Math and created an after-school Math Club program to provide students with extra help.

The Hess Word ID assessment has been used in grades one through three to strengthen phonics, spelling, and vocabulary development over the past several years. This year, the district has invested in a new phonics program, the Reading Wonders phonics program, which is being fully implemented in all grades this school year.

The core curriculum formative assessments, which are teacher-administered, are the most often used interim assessments. The results of these assessments are discussed in collaborative, grade-level teams. Teachers use results to inform lesson plans for each curriculum unit and to track student progress through the course of each unit.

At the end of a unit, teachers administer common end-of-unit tests and then collectively analyze the results, asking three questions:

1. How did the grade-level students perform overall?
2. Were there differences across classrooms? If so, why?
3. What changes should be implemented to improve instruction and attain better results?

Extra Help Strategies for Students at Risk of Academic Failure

Chadwick has a sophisticated and complex approach to providing extra help (i.e. additional instructional time and services) to "students who need more." The school uses this phrase to identify students whom other schools might call "students who struggle to learn standards." To begin, Chadwick counts on its grade-level teachers to provide strong instructional foundations, including many Tier 1 interventions. These Tier 1 interventions are facilitated via small groups during reading and math instructional blocks. The school schedule is structured so that the specialized teachers can provide push-in support in classrooms during the small group times. LEP teachers, special education teachers, math and reading resource teachers, and the three instructional aides (two of whom are licensed teachers) may also assist in classrooms at appropriate times to provide small groups, and sometimes individual students, with extra help as needed. For some students who need even more help, there is pull-out, one-on-one instruction. But two-thirds of the time this extra help happens within the regular classroom in small groups during reading and math blocks.

This represents a change for the LEP teacher who used to provide pull-out instruction in LEP. This teacher now works almost exclusively with students, both inside (approximately two-thirds of the day) and outside (approximately one-third of the day) the classroom. Her work addresses the extra help LEP students need to learn the skills and knowledge required by the core curriculum.

Moreover, when listening to various teachers describe this approach to classroom support, there was rarely reference to student subgroups, such as LEP or Title I students. Instead, the conversation was always about identifying differentiated student needs and complementing core instruction with both push-in and pull-out strategies. This way, Chadwick addresses student needs in appropriate whole group, small group, and individual contexts. The goal is to provide appropriate differentiated instruction based on student needs irrespective of demographics.

This complex strategy works quite effectively as evidenced by the low incidence of students with mild and moderate special education needs, and the even lower incidence of students with learning disabilities. These low incidences can be attributed to the fact that Chadwick provides so many preventative and extra help services – the prekindergarten program, the smaller class sizes for kindergarten (making small groups even smaller), and the multiple push-in and pull-out services (Borman & Hewes, 2003; Frattura & Capper, 2007; Levenson, 2012; Madden, Slavin, Karweit, Dolan & Wasik, 1993; Slavin, 1996). It also would be fair to say that the phonics-focused reading program is another factor in decreasing the numbers of students with learning disabilities or special education needs. The reading program is designed to educate students first in phonics, second in vocabulary and reading fluency, and finally in multiple comprehension strategies. This sequenced, systematic reading focus helps ensure that, regardless of a student's starting position, he or she receives reading instruction and extra help that leads to reading proficiency (Felton, 2010; National Reading Panel, and; Torgeson, 2004).

In addition, Chadwick has developed multiple after-school programs to provide more instruction for students who need extra learning time. These programs include:

- Math Club. This program was created over nine years ago to help students identified as needing remediation in specific standards in order to achieve success;
- Homework Helpers Club. This program is about 15 years old. It is offered two days a week, for an hour each day, to provide homework help for students who have difficulty completing homework at home. The program funds two teachers along with middle school, high school, and federal employee volunteers. The Homework Club runs from October through April;
- Read at Home. This program encourages students and families to read at home; and
- MESA Program. This program focuses on mathematics, engineering, and science, and has been operating as a challenging science, technology, engineering, and mathematics (STEM) program to provide critical thinking challenges for the school's grades four and five students.

Professional Development

According to the principal and to most teachers, professional development in Chadwick is continuous. It begins with intensive collaboration among all teachers, especially grade-level teams, where staff members interact over student data to improve lesson plans and overall instruction.

Monthly faculty meetings include professional development on specific issues and topics. Recent emphases included a discussion of strategies for asking more detailed higher order questions, and an analysis of the demands of the forthcoming PARCC assessments. Notable components of professional development include:

- Professional development in reading largely provided by the principal but with contributions from the STEM teacher and members of the school leadership team;
- professional development from the math teachers, stemming from best practices as well as conferences and professional development opportunities offered outside the school. Math teachers then provide this information for all teachers in the school; and
- assistance for individual teachers who may need extra help, provided during before-school, after-school, or regular school hours.

Several teachers in the school have worked over the summer on Baltimore County Public Schools district-sponsored curriculum development and instructional strategy issues. This work has intensified because of the changes required by the new state standards. Chadwick also sponsored a summer professional development series on what is called the Chadwick Approach to the Daily Five of Reading, an instructional approach incorporating whole class lessons, small groups, responsive journaling, individual independent reading, and vocabulary development.

School Culture and Leadership

The culture of Chadwick can be characterized as one of accountability for results for all students, commitment to get the job done, collaborative and collegial work habits, dense instructional leadership, and a professional orientation to the job.

The principal holds teachers accountable for student performance and for maintaining an appropriate pace for covering curriculum. In turn, teachers feel accountable for student achievement results. When test results show students do not perform well enough, teachers respond by working in their classrooms and with their grade-level teams to make changes to instruction.

Further, staff members feel accountable for the performance of *all* students, not just the students in their classrooms, grades, or groups. Several teachers said, "We do not want any child to fall through the cracks." This school sees students as students, with varying needs that must be addressed by differentiated instruction every day in every classroom.

Teachers and the principal are committed to the school and to student performance results. Teachers invest their time and energy heavily to meet the goals of the school. Teachers said they come early and stay late, and work with each other on the weekends. They are relentless in producing effective student performance. The principal called herself "obsessive compulsive" in her efforts to improve the curriculum and instructional program, particularly the reading program. Staff said they would do anything and everything to allow each student to be successful academically.

The culture was intensely collaborative, with multiple teaming structures from grade-level teams to the school leadership team. The collaboration went beyond the formal meetings. Teachers said they interacted all the time, on virtually everything. In the early grades, teachers developed the same lesson plans, taught them simultaneously, used the same end-of-unit tests, reflected together on results, and worked to make the unit more effective for the next year.

Teachers referred to themselves as a family. This sense of camaraderie included the principal, who was viewed as a reading expert, and as "tough" but also supportive and understanding of the teachers' need for autonomy and independence.

Instructional leadership was dense. The principal was seen as a strong instructional leader and a reading expert in the school. Examples of teacher leadership included lead teachers who directed each grade-level team and served on the school's leadership team, classroom teachers with advanced degrees in reading who are viewed as resources in reading instruction, and the grade four math teacher, who serves as the school's math instructional coach and provides professional development in math to all teachers in the school. Many teachers who received professional development outside the school then relayed their new knowledge to the rest of the faculty.

Finally, Chadwick is highly professional. The reading program reflects research on effective reading from multiple sources like the National Reading Panel, Reading First, and the National Institute of Child Health and Human Development (NICHD). The school, the principal, and most of the teachers were aware of changes coming from the State's new standards. Before the State adopted its new standards and the district modified the reading and math curricula to include them, Chadwick staff had already begun to change the school's curricula to reflect the standards. When asked whether the MCCRS represented a brand new way of teaching math and reading, the answer was no; the MCCRS simply reflect good reading and math curricula. The school continues to take the mandated new curriculum and use it as a springboard to build lessons and units adapted to the needs and interests of its unique student body.

Summary

What makes this school work? Why is it so effective in having nearly all students perform to proficiency in reading, math, and science? Critical factors are many, but include the following:

1. Smart and capable teachers. Top teacher talent or "teacher talent – cubed" as one teacher put it, is central to Chadwick's success. The principal spends hours recruiting teachers, interviewing and observing them, developing them after they are hired, and working hard to retain them. The goal is to equip every teacher with the skills needed to tailor the curriculum to the needs and interests of the students in the school. Teachers in this school understand the skills and knowledge goals for each reading and math unit. They can compare these goals to the MCCRS and the Baltimore County Public Schools' district curriculum standards, and then adapt materials and lessons to fit their students. In several different ways, the school works to place the strongest teachers with the kids who need the most help, both for whole class and small group instruction.
2. Small class sizes, a factor identified as effective by the principal and most teachers. With a school-wide average class size of 21 students, Chadwick creates an environment where teachers can work with small groups of seven or fewer students in their classrooms. Small class sizes enable core teachers and several push-in teachers to provide the extra help students need to achieve to proficiency levels.
3. Strong leadership. As many teachers put it, the principal is "tough and understanding." The principal has high expectations for teacher performance and provides ample support. The principal is strict but gives teachers substantial independence. Teachers have the freedom to make lessons more creative, to link the issues and topics to student interests, and to make learning interesting. This approach works in part because the school's teachers are highly talented and professional. Furthermore, there is accountability for results, so if an innovation strategy does not work to produce student learning, it is changed.
4. The principal holds teachers accountable for both student performance, irrespective of learning challenges, and for keeping pace with the curriculum to ensure that all units are taught to all

students each year. Pace and full curriculum coverage are important because students build on each previous year as they move upward through the grade-levels.

5. Collaborative culture. Collaboration happens at all grade-levels, includes all teachers, and occurs all the time. The school has an intensely collaborative culture, with multiple forms of both formal and informal collaboration. This includes incorporating all specialized, extra help teachers into discussions of the core instructional program.
6. Commitment to the school and to ALL students. Chadwick teachers are not just concerned with students in their class or grade, but with students across the entire school. This includes commitment to student academic needs, regardless of student background. Teachers view all students as having differing learning styles and needs, and all can benefit from differentiated instruction.
7. Multiple interventions. Interventions provide extra help for students beginning in prekindergarten, then continuing with extra help push-in strategies in kindergarten through grade five classrooms. Interventions are designed to ensure that no student falls behind.
8. Accountability for results. For everyone in the school – teachers, administrators, and students – accountability for results is the mantra. Whatever the curriculum, or the "Chadwickified" pedagogy, the test is whether it worked – whether students performed to proficiency. When issues emerged, teachers went back to the drawing board and changed the curriculum and instructional approach to improve results for the next year. The school is relentless in its mission to educate every student to a performance level that is proficient or higher.

Alignment with the EB Model

The strategies of this school are strongly aligned with the school improvement model embedded within the evidence-based funding model (Odden & Picus, 2014). In terms of school improvement, the following strategies of this school parallel those of the EB model:

- Clear school goals focused on student performance in core subjects;
- strong instructional leadership provided by the principal with additional instructional coaching provided by other teachers;
- curriculum and instructional strategies driven by student performance data;
- a systemic, school-wide curriculum for the reading and writing programs emphasizing phonics and comprehension, and for the math program emphasizing automaticity of math facts and core mathematics concepts used in multiple problem solving situations;
- collaborative teacher teams using common lesson plans, curriculum units, formative assessments, and end-of-unit tests;
- multiple and sophisticated extra help strategies to ensure that students develop reading and math proficiency in the early grades so as to reduce the incidence rates of students with learning problems in later grades;

- ongoing professional development;
- collaborative culture; and
- accountability for student achievement results.

Though the specific manifestations of these core school improvement features were unique to this school, the overall strategies are very much in line with the EB model.

Moreover, the overall resources at Chadwick are highly aligned with the EB model, including core class sizes, levels of elective and specials teachers, instructional coaches, special education teachers and aides, other staff to provide extra help not linked to a specific disability, pupil support staff, and pupil-free time to enable grade-level teams to collaborate during the regular school day (see Odden & Picus, 2014). The EB model does provide a more robust prekindergarten program and more summer school resources. Overall, though, there is nothing about the strategies and resource levels in Chadwick that would suggest a major modification of the EB funding model.

This school's focus on recruiting and keeping top teacher talent is perhaps the most important factor behind its effectiveness. The teachers in this school exemplify a high degree of professionalism and expertise, allowing the school to deploy its sophisticated and complex curriculum and its set of core and extra help strategies. This strategy underscores the importance of how resources are used. Smart and capable teachers equipped with an array of effective instructional strategies can influence student performance more than average or below average teachers.

This school's efforts – to recruit only top teacher talent, to then invest in training and collaborative work to ensure that these teachers have the full array of needed instructional expertise, and to work to retain these teachers in the school – exemplify an effective use of educational resources. While the school's curriculum and instructional program are certainly important, it could also be said that the core lesson from this school is that top teacher talent matters and is key to the effectiveness of a school.

Chapter IV: Chillum Elementary School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Submitted by
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Executive Summary

Chillum Elementary School is an example of the second category of schools – an improving school with high growth.

The case was developed through interviews with the principal and key teachers, a review of informal documents provided by the principal, and information about the school's curriculum and instructional program on the school's website. In fall 2014, Chillum Elementary School in Prince George's County Public Schools enrolled 274 students in prekindergarten through grade five. The school is 97 percent minority (59 percent Hispanic and 38 percent African American) and 85 percent free and reduce-priced meals (FRPM). In 2012 and 2013, 81 percent of its students performed at or above proficiency in reading, math and science, compared to only 60 percent in 2010. The school's performance did experience a decline to 73 percent proficient or advanced in 2014.

Nevertheless, the school has exhibited significant academic growth over time. Chillum Elementary places a strong focus on high expectations for all students, building and retaining a strong instructional staff, focusing on early interventions, and emphasizing literacy instruction. It is a data-driven school that administers a number of both formative and summative assessments.

Some key factors behind the school's results are:

1. The school has a common vision and a culture of high expectations. New teachers who are hired are chosen because they fit into the culture.
2. The school emphasizes professional development. A lead teacher serves in the role of instructional facilitator, and time for professional development is embedded into the school schedule and after-school.
3. There is a focus on frequent data-driven focused interventions for students at risk of academic failure.

The overall strategies used by Chillum to produce its high level of growth are aligned with the improvement system embedded within the EB model, and do not require any changes in the EB model to reflect specific strategies this school used to produced its high level of performance.

Introduction

Chillum Elementary School is nestled in a working class community is Hyattsville, Maryland, approximately 35 miles southwest of Baltimore. The school is in a "walking community," meaning that most of its 274 students walk to school from their homes in the neighborhood. The school utilizes one bus to transport the few students who live too far away to walk to school. The student body is 59 percent Hispanic and 38 percent African American students.

Chillum Elementary is a School-wide Title I school, with more than 85 percent of the students participating in the FRPM program and all of them participating in the Maryland Meals Breakfast Program. Nearly one-third (32 percent) of students are limited English proficient (LEP). Yet, despite these demographics, only six percent of students require special education services.

At one time the school was one of the most overcrowded in Prince George's County Public Schools, but a decline in enrollment and new attendance boundaries have reduced the school's size to the point where it no longer needs portable classrooms to house all of its students. In recent years, demographics have also shifted the school from majority African American to majority Hispanic students. In addition, in the 2014-2015 school year, Chillum gained kindergarten students who were not able to enroll through a lottery process into the dual language immersion program in a neighboring school. These newly enrolled students required the establishment of an additional kindergarten classroom at Chillum. Reorganization within Prince George's County Public Schools also led to the loss of grade six in 2014-2015.

Chillum is a kindergarten through grade five school with both Head Start and prekindergarten programs on-site. Table 4.1 shows grade-level enrollment and average class sizes for the school. With the exception of grades three and four, all grades have at least two classrooms. Kindergarten is the only grade-level with three classrooms.

The school provides two half-day sessions of prekindergarten for 32 students total. Two years ago, the school was able to offer a full-day prekindergarten program. In addition, the school provides full-day Head Start for 13 three- and four-year-old students. Parents have to apply for Head Start and there is a waiting list for enrollment.

Table 1 shows that average kindergarten to grade five class sizes range from 18 to 33 students. According to the principal and staff, grades three and four are unusually large this year. The grade three classroom is the only post-kindergarten classroom with an instructional aide.

Table 1
Chillum Elementary School Class Sizes

Grade-Level	Class Size
Head Start	13
Prekindergarten (2 classes)	16
Kindergarten (3 classes)	19
One (2 classes)	19
Two (2 classes)	20
Three (1 class)	33
Four (1 class)	27
Five (2 classes)	18

School Performance

Table 2 shows the composite performance data (combined reading, math, and science scores) for Chillum Elementary for 2007 through 2014. Overall student performance, measured as the composite percent of student achieving proficient or advanced on the Maryland School Assessment (MSA), improved from 66 percent in 2007 to 81 percent in 2012, a 15-point gain over six years.

Table 2
Chillum Elementary School Performance, Maryland School Assessment (MSA), 2007-2014

School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	66	65	60	76	76	81	81	73
FRPM Students	66	62	60	75	74	81	NA	NA
LEP Students	60	62	58	69	68	75	NA	NA
Non-White/ Non-Asian Students	66	64	60	76	75	82	NA	NA

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

When data are disaggregated for particular subgroups of students, the results are consistent with the overall performance of the school. Students who qualify for FRPM show the same 15-point improvement from 66 percent to 81 percent proficient or advanced, as do non-white and non-Asian students. The latter group's performance increased one additional point, from 66 percent to 82 percent proficient or advanced. The only subgroup with noticeably different scores is LEP students. This group's performance also increased 15 percentage points over the six-year period, but because the starting point in 2007 was six percentage points lower than the school average, the same six-point difference remains in 2012.

School Staffing

Table 3 shows the school's staff, consisting of 24.1 full-time equivalent (FTE) certified and 12.0 FTE classified staff. Classroom teachers make up the majority of the certified staff, with 14 classroom teachers, including prekindergarten and Head Start. The school employs 1.7 FTE teachers for art, music, physical education (PE), and a media specialist. Another 4.9 FTE certified teachers provide instruction in special education to LEP students, and to students who require extra help in reading and math. School leadership is provided by a principal and an instructional coach, and pupil support is provided by one guidance counselor and one school nurse position (vacant at the time of the visit). The 12.0 FTE classified staff includes 4.0 FTE instructional aides, 2.0 FTE clerical staff, 3.0 FTE custodians, and 3.0 FTE cafeteria staff.

Table 3
Staffing at Chillum Elementary School

Category	FTE
Administration	
Principal	1.0
Assistant Principal	0
Clerical	2.0
Prekindergarten Program	
Licensed Teachers	1.0: prekindergarten 2.0: Head Start
Instructional Aide	1.0
Prekindergarten Parent Helper	0
Main Program	
Core Teachers	11.0
Elective Teachers	0.2: Art 0.5: Music 0.5: PE
Instructional Coaches	1.0
Special Education Self-Contained (Severe and Profound)	0
Special Education (Mild and Moderate)	2.0
LEP Teachers	1.5
Tutors/Tier 2 Interventionists	1.0 Math Resource Teacher 0.2 RTI Reading 0.2 RTI Math
Librarian	0.5 Media Specialist
Aides	
Instructional: Title I	1.0 Grade three
Special Education Self-Contained (Personal Assistant for Child with Visual and Physical Disabilities)	1.0
Special Education, Inclusion	1.0
Pupil Support	
Licensed	
Guidance Counselor	1.0
Nurse	1.0 (vacant)
Psychologist	0
Occupational Therapist	0
Physical Therapist	0
Non-licensed	
Behavioral Specialist	0
Lunchroom Staff: 1 Manager and 3 Assistants	3.0

Prince George's County Public Schools utilizes student-based budgeting, which allows the school to "purchase" staff within its allocated budget. In addition to the budget allocation, the district will provide additional staffing resources. In the 2014-2015 school year, the district allocated a 1.0 FTE Community Outreach Liaison to work with the school. This allocation may change from year to year.

The principal can hire teachers and other staff within the school's budget allocation when vacancies arise. The district will perform an initial screening of applicants to ensure their eligibility (e.g. fingerprint checks), but the ultimate hiring decision is in the hands of the principal. This allows the principal to hire the candidate she sees as the most qualified to further the school goals and best fit into the existing school culture.

School Goals

Chillum Elementary does not have a set of unique school goals, but instead aligns its activities with the goals and performance objectives (i.e. Adequate Yearly Progress) set by the district.

The school staff determines how to meet the following expectations:

Goal 1: High Student Achievement. Students will receive education that is rigorous, engaging, and relevant to the future.

Goal 2: Highly-Effective Teaching. Teachers who are effective will have students who are engaged and excited about learning, able to communicate what they have learned, and can demonstrate high performance on standardized tests and other academic measures.

Goal 3: Safe and Supportive Schools. Schools will be a safe environment in which students and teachers are able to focus on instruction without distractions, and the staff will provide the highest level of customer service in both schools and offices.

Goal 4: Strong Community Partnerships. The school system will strengthen existing public and private partnerships and aggressively seek opportunities to establish new partnerships with parents, businesses, government representatives, and community leaders who are willing to assist in meeting student achievement goals.

Goal 5: Efficient and Effective Operations. The school system will perform non-instructional operations as efficiently and effectively as possible, and will continue to streamline processes and become efficient in all areas.

While Chillum does not have unique school goals, the school does have a set of commonly held values around which practice is structured. Current and newly hired staff members are expected to share these values and contribute to these common goals.

The following is taken from the school's Title I School Improvement Plan:

Vision Statement: Chillum Elementary School strives to create a safe environment, which fosters the development of responsible and caring students who are critical thinkers. It is the vision of the school to prepare students academically for college and careers by striving for excellence in education.

Mission Statement: Chillum Elementary School will provide a challenging and comprehensive academic program that meets the educational, physical, social and emotional needs of every child. Staff, parents and community members will work collaboratively to ensure students receive a high-quality education. The learning environment will promote high expectations for every student through professional development, collaborative leadership, integration of technology, and reflective teaching practices of educators. In order to achieve the vision of the school, students will take pride in a job well done and do their best.

School Motto: Doing Our Best on the Road to Success!

School Schedule and Collaborative Teams

A committee of Chillum teachers creates the class schedule, making sure that they meet the district's requirements for instructional minutes in each subject while trying to create uninterrupted blocks of time for instruction. To the extent possible, they also build in time for collaborative planning and professional development, though this part of the schedule changes from year to year depending on the allocation of specialist teachers.

The school day at Chillum Elementary begins with breakfast for all students from 8 to 8:15 a.m. All students have a 30-minute lunch and a 15-minute recess during the day, leaving five-and-one-quarter hours of instructional time, or 315 instructional minutes. Most of the instructional hours are spent on teaching core subjects (reading/English language arts, math, science, and social studies) in all grades. The times for each subject vary by grade-level, with more time spent on reading/English language arts in the earlier grades and increasingly more minutes on math, science and social studies for the later grades.

Reading/English language arts (R/ELA) blocks of 150 minutes are used in kindergarten and grade one. The block is 135 minutes in grade two. In grades three through five, R/ELA time is split into multiple shorter sections totaling 105 minutes.

Math instructional time begins at 60 minutes for four days a week and 30 minutes for one day a week in kindergarten, 60 minutes for five days a week for grade one, 75 minutes for five days a week for grade two, and 90 minutes for five days a week for grades three through five.

Science instructional time is 45 minutes for four days a week and 30 minutes for one day a week in kindergarten, 45 minutes for five days a week for grades one and two, and 60 minutes for five days a week for grades three through five. Social studies instruction is 30 minutes for five days a week for grades kindergarten through five.

The two grade three and four teachers and the two grade five teachers have opted to teach in teams rather than as self-contained classrooms. In each case one teacher teaches R/ELA and social studies while the second teacher teaches math and science.

All grades have a specials period for art, music, media, guidance and PE for 30 minutes for three days a week and 45 minutes for two days a week. Staff indicated that scheduling the special subjects can be challenging, depending on how many specialist staff are allocated to the school and whether they are full- or part-time staff. This also has an impact on their ability to schedule collaborative time for teachers. For the 2014-2015 school year, grade-level teachers have common planning and preparation times during specials, allowing for collaboration in grade-level teams; the two grades three and four teachers have common planning and preparation times. In previous years, the school has approached collaboration differently. Last year, for example, they scheduled the time after-school. This year the staff has chosen to build in into the daily schedule.

Curriculum and Instructional Program

Chillum, along with the rest of the district, uses the following mathematics and reading programs: McGraw-Hill My Math for grades kindergarten through four, Pearson's enVisionMath Common Core in grade five, Houghton-Mifflin's Reading Wonders series in grades kindergarten through two, and Pearson's Reading Street Common Core in grades three through five. According to the principal, the instructional programs are embedded into the textbooks and the district creates a grade-level specific curriculum instructional map that teachers utilize for daily instruction.

The principal and teachers of Chillum Elementary have focused on a strategy heavy with early literacy interventions and the extensive use of flexible small group instruction in both reading/English language arts and math in all grade-levels. This strategy allows them to focus on the quality of instruction, regardless of changes to the curriculum textbooks and other materials chosen by the district.

Chillum Elementary historically has had a strong primary grade focus on literacy. The goal was to have multiple avenues to catch students who were at risk of academic failure, intervene, and allow them to continue to grow at the appropriate grade-level. Classrooms have been small enough in recent years that small reading groups serve as the primary method for delivering reading instruction for Head Start and prekindergarten. They are also used extensively in kindergarten through grade five. Classrooms are set up so that students receive instruction from the teacher, can work in small group centers, or engage in individual work. The teacher moves around the classroom during center and individual work time, as do any support teachers in the classroom (e.g. LEP teacher, RTI interventionists).

Head Start and prekindergarten begin with home visits to determine with parents where children are, what they might need in terms of academic supports, and what expectations parents have for their children. The Dial 4 Assessment is used to create small groups for instruction. Students are given diagnostic assessments as soon as they show any indication of falling behind. These assessments drive interventions and any special education services that may be needed.

Up until the 2010-2011 school year, the school used Reading Recovery, a short-term, focused reading intervention, usually provided one-on-one, for grade one students falling behind. Reading Recovery also came with a reading specialist, but this position was no longer assigned to the school starting in 2012-2013. The lead teacher now serves this role to some extent.

The two RTI interventionists work primarily with grades one and two students and a few grade three students. They work with groups of three students for 30 minutes, three times a week for 12 weeks at a time.

The school library has been "leveled" so that students can find books that are appropriate to their reading level and to help teachers make challenging, yet appropriate reading recommendations to students. The school also makes use of Writing Fundamentals to support writing instruction and recently extended it into kindergarten to smooth the transition from kindergarten to grade one for students.

The State's new College and Career-Ready Standards have brought changes to the mathematics curriculum, in particular, with many district teachers participating in the realignment of math content to appropriate grade-levels. As part of the changes in mathematics, Chillum has begun to make use of small, flexible grouping in math instruction as well as in reading/English language arts. The school has one math resource teacher who works in concert with the classroom teachers to make this happen.

The school has also begun to incorporate online curriculum materials into the classroom, making use of MyMath'*s* online component as well as the homework module, which students may access at home. IReady also has online components for math and reading, and Chillum has been using these for a few years.

Through the district, the school has a longstanding partnership with the America Reads America Counts program at the University of Maryland. Through this program, university students receive training from district reading specialists in Reading Recovery and general tutoring practices. In turn, they work one-on-one with Chillum students who are struggling with reading or math.

Another partnership, with Junior Terps – University of Maryland student volunteers – offers enrichment activities for two hours a week to students in grades three through five who are "proficient or advanced." This partnership has been in place for three years.

Partners in Print is yet another partnership with the University of Maryland that brings volunteers to Chillum to work with parents and students. Sessions occur six evenings throughout the school year. The program provides books to families and through the use hands-on activities for parents and students, it develops reading literacy skills that can be practiced in the home.

The principal and staff believe the focus on early literacy, using multiple avenues, has paid off as students make a fairly smooth transition to the intermediate grades. They also attribute the school's remarkably low special education rate to this same focus.

Assessments

There are many assessments used to inform instruction, instructional groupings, and professional development activities at Chillum Elementary. Assessments vary from end-of-unit tests to state summative assessments, such as the Maryland State Assessment. In between, the school uses district benchmark assessments for progress monitoring and a host of early literacy diagnostic and inventory tools to catch students who are struggling in the early grades. Following is a list of assessments discussed during the school visit:

- Kindergarten-grade one Literacy Assessment. Data are used to group students for instruction and for determining the appropriate level books. Running Records are also used in the early grades;
- Directed Reading Assessments for kindergarten through grade two. It is the most consistent assessment as it has been used the longest at the school. The DRA is also used for determining reading levels as well as providing information about reading fluency;
- Scholastic Reading Inventory. It provides similar information as the Directed Reading Assessment, but it is administered to students in grades three through five. If they score beneath a certain level on the SRI, students are also given the DRA and data are used to provide interventions;
- End-of-unit assessments (textbooks). The data are used by classroom teachers to determine student mastery of the content. MyMath also has pre-assessments, which gauge mastery of the content before unit lessons (i.e. pre and post);
- District quarterly benchmarks aligned to the State's College and Career-Ready Standards. Data are used to monitor progress on school- and district-wide instructional goals as well as to inform interventions and instructional grouping, and in some cases, classroom placement of students; and
- IReady. It has a diagnostic assessment that gives teachers information about student skills and helps identify appropriate interventions.

The principal and staff make extensive use of the information they obtain from assessments administered to Chillum students. Data are often used to plan for interventions and to drive student groupings for instruction. Data from assessments have also been used to move students from one classroom to another. Results are also used to identify school-wide focus areas (e.g. the increased attention to math in recent years) and to identify professional development needs.

Much of the review of assessment results occurs during staff meetings and the common planning and preparation time built into the weekly calendar.

Extra Help Strategies for Students at Risk of Academic Failure

Chillum Elementary utilizes a combination of in-classroom and pull-out strategies to help students who are struggling to meet the academic content in their classroom. Both LEP and special education teachers

partner with the classroom teachers to identify appropriate interventions for English language learners and work through the Individualized Education Plan of students with disabilities.

In the case of LEP students, much of the support happens through the use of small groups within the regular classrooms and some small group pull-out instruction. How students are grouped is determined and evaluated during the common planning time for teachers during the week. Historically, the focus of LEP teachers has been on literacy, but that has recently expanded to include math as well.

The school has relatively few students identified as special education (six percent), something not usually found in a high-poverty school. The school does utilize pull-out strategies to support students with disabilities, taking them out of the classroom for one-on-one and small group instruction. When asked about this low rate of special education, school staff attributed the low rate to their focus on early grade interventions, including the Head Start and prekindergarten programs in the school, and small classrooms in recent years. It is their opinion that the focus on literacy in the early grades pays off and the amount of one-on-one and small group instruction they are able to provide has resulted in fewer special education students.

For students who do require special education services, instruction is provided by a special education teacher and sometimes a paraprofessional who pull students from the classroom for one-on-one or small-group instruction.

In addition to the LEP and special education teachers, the school has additional staff providing Tier 2[15] interventions to students. The school has a math resource teacher who provides pull-out instruction for small groups of students. The district also provides a 0.2 RTI teacher in reading and a 0.2 RTI teacher in math. The RTI staff members are shared with two other schools. And while the school does not have a reading specialist, the lead teacher serves in this role, often providing one-on-one instruction to students during her classroom visits.

Another significant resource available to students and teachers at the school is the number of volunteers who provide one-on-one support to students at risk of academic failure in reading and math. The number of volunteers in the America Reads America Counts program fluctuates, but during the school visit for this case study, three student volunteers were observed providing one-on-one instruction to students.

The school has also leveraged Title I money to provide extended learning opportunities in the form of an after-school program four-hours per week from October through May.

In the past, resources for summer school were also provided to support a four-week, half-day program focused on reading and math. The school has not had summer school for the last two years.

Professional Development

Professional development (PD) is a priority for teachers at Chillum. At both the end of the previous year and the beginning of a new school year, the principal and staff engage in a PD assessment, where they determine their needs and their capacity to meet them. In some instances, the needs may be met through PD available through the district. In other cases, teachers at the school are called upon to develop and provide PD for their fellow teachers. This practice has become more widely used as the district has cut professional development budgets. While PD for individual teachers may be differentiated, there is an expectation that it be focused and aligned to the goals of school and district.

The district calendar provides three pupil-free days and two two-hour early-release days for professional development. A committee of teachers creates the class schedule and builds in the time for collaborative planning for teachers. The school also schedules an hour once a month for school-wide planning.

The district provides additional PD for new teachers and the school builds support for them throughout the year, including mentoring by more experienced teachers and the lead teacher. Historically, the faculty at Chillum has been very stable with few, if any, new teachers starting in any given school year. This has allowed prior years' investments in professional development to remain in the school, even after PD funds have been reduced. Chillum's experienced teachers have, in turn, been able to mentor and support new teachers in ways that may not have been possible in a school with a higher teacher turnover rate.

A key instructional strategy at the school is flexible student grouping and a significant portion of the school's allocated PD time, 30 minutes twice a week for collaborative planning, is spent reviewing student data to inform the grouping of students, plan interventions, and evaluate the effectiveness of those interventions.

Along with the principal, instructional leadership at Chillum comes from the school's lead teacher, who functions as an instructional coach as well as reading specialist. She models instruction for teachers and provides assistance with classroom strategy. Her day consists largely of classroom visits, where she offers coaching to teachers and one-on-one support to students during lessons. Because she is not an administrator, her observations and feedback are not "evaluations" and are not seen as punitive, but are viewed instead as pure coaching opportunities.

The school also makes use of "learning walks," a process by which teacher teams visit and observe each other's classrooms. If needed, the school will hire substitutes for the day. The observations are guided by a structured protocol and they are usually done as a follow-up to a particular PD session to see how the new learning is being translated in the classroom. The data and feedback collected from the learning

walks are then used to inform the planning of future PD sessions if, for example, there is a need for reinforcement.

Much of the professional development provided by the district in recent years revolves around transition to the State's College and Career Ready-Standards and the use of data to inform instruction. The district has adopted a train-the-trainer model in which lead teachers are chosen at each school. They receive the PD training from the district and are then expected to return to their school and provide PD for their colleagues. In addition to new standards alignment, the district invested in the PD on the Data Wise school improvement process as outlined in the Richard Murnane book, *Data Wise: A Step-by-step Guide to Using Assessment Results to Improve Teaching and Learning*.

This year the district has begun using Teachscape, a professional learning online system that allows teachers to log in and access PD materials, including videos and online communities, and participate in training sessions and administer the corresponding assessments. Teachers must take the PD modules required by the district, but they are free to choose what they take beyond that.

School Culture and Leadership

"Doing Our Best on the Road to Success!" is Chillum's motto and the principal and staff members interviewed take this to heart. All staff spoke of the school's culture as one of high expectations for students, "They know we expect the best from them and they try to do their best," and for each other, "[students] like to do well and they expect the adults to model for them."

Leading by example is important at Chillum. Teachers are "modeling champion behavior." The principal and staff describe each other as members of a "very hard working staff" and are proud that "people don't watch a clock," and "we go home and we're still working." Staff also spoke of a school culture that is accepting of people, "Everyone is accepted because everyone is a champion," and of new ideas, "Teachers want to come up with something and there's room for that," and there is "always opportunity to try new ideas, if you want to step out and be a leader." One longtime teacher at the school said she originally chose Chillum because of its location, "then stayed because we have a sense of family."

The principal and teachers have created an environment where students feel "safe and protected" and where "they feel comfortable enough to come to the office to let me know every little thing." The principal walks the halls, is present in the lunchroom, and visits classroom frequently, checking in with students by name. "They know who we are and they know we care for them. They try to live up to the expectations we have for them." Sometimes, when students do not live up to expectations, both staff and students have a say in the consequences, "[students] know that when it comes time that they haven't met the expectations, sometimes we let them decide the consequences."

Staff members spoke proudly about their overall lack of behavioral problems in the school. Although the school is part of the district's Positive Behavior Interventions and Supports program for the first time this school year, it had been implementing a number of PBIS strategies previously, including a "Chillum

bucks" reward system for positive behavior. Staff members see this as a direct result of the expectations they have for students and the family environment they have created.

Approximately 10 years ago, the school surveyed parents about uniforms. The parents voted in favor of school uniforms, an important contributor to the sense of family in the school, according to staff. As one interviewee said, "I love the uniforms, it makes us all joined together."

Parents at Chillum are supportive at various levels. The school has an active Parent Teacher Organization, and many parents attend school events. The staff recognizes that some parents can be more involved than others and acknowledge that for some parents, being involved is making sure their children go to school. The district supports the school in reaching out to parents by providing interpreters for meetings and by providing a community outreach liaison to the school.

Summary

The story of Chillum Elementary School's success at improving student achievement is one of multiple early literacy efforts, frequent and focused interventions for students not quite keeping up, and an emphasis on professional development for teachers. It is also a story of perseverance and consistency. The school principal and many of its teachers have been at Chillum for at least a decade which, they say, has allowed them to set a path and stick to it. They have created a school culture of high expectations for students and for each other, and they have made hiring decisions consistent with their vision of the school.

Relatively small class sizes in recent years have allowed for extensive use of individual and small group instruction at all grade-levels. The availability of RTI interventionists, a math resource teacher, a reading specialist (until recently), the lead teacher, and a number of volunteers through partnerships with the University of Maryland have allowed this to happen. Most of their efforts have focused on literacy, but the transition to the State's College and Career Ready-Standards and the more challenging content have pushed the school to expand its focus to math.

Chillum has also been able to leverage its partnerships with three University of Maryland groups – America Reads America Counts, Partners in Print, and Junior Terps – to provide additional instructional support to students on a regular basis. Trained America Reads volunteers provide individual and small-group instruction to students who may be struggling; Partners in Print volunteers work with students and parents on improving literacy skills; and Junior Terps provide enrichment opportunities to students who are ready for more advanced work.

The district and the school have made significant investments in professional development over the years. In recent years, resources for professional development have fluctuated, but the staff's relatively low teacher turnover has allowed investments made in prior years to remain in the school. Furthermore, a significant amount of the school's PD has centered on the effective use of data to inform their flexible grouping strategy – they identify, group, evaluate, and regroup students regularly based on multiple

sources of data. These two things – consistency in teaching staff and a focus on data use – are curriculum neutral, meaning that teachers have a set of skills that apply to any subject or grade-level, regardless of the particular textbooks or assessments used.

A few interviewees mentioned that the school had a few new teachers this year, an unusual situation in their experience. They felt that they had made good hiring choices, pointing out that they had chosen to hire "not new teachers, but teachers that are new to the school." However, they also indicated the importance of mentoring the new-to-the-school teachers so that they could transition into the school culture and practices. The loss of teachers means a loss of knowledge and skills and, in a climate with diminishing professional development resources, they see teacher turnover as a potential challenge to continued increases to student achievement.

Chillum is experiencing "a lot of new." There is a new chief executive at the district, new content standards, new textbooks, shifting school boundaries, and new teacher and principal evaluation systems tied to student learning objectives. And yet, regardless of all the new, the elements that have remained consistent up until now – early literacy, data-driven interventions, and professional development – continue to be a priority. The principal and staff can see the fruits of their labor in the culture of the school and in the improvements in student achievement and appear committed to continue to "stick to it."

Alignment with the EB Model

The approach used in this case study of resource allocation was not to ask the school principal and teachers for how they make resource allocation decisions. Instead, the interviewees are asked, "Tell me how the school accomplished the achievement gains we identified." From this starting point, it is possible to learn how resources – people and time – are allocated in the school. The Chillum story shows clear and significant alignment to the instructional strategy embedded in the evidence-based model of school finance.

1. The school has a common vision and a culture of high expectations. Any new teachers who are hired are chosen because they fit with the culture.
2. The school has a lead teacher who serves in the role of an instructional facilitator. The lead teacher models instruction and provides non-evaluative feedback to teachers on a regular basis.
3. Class sizes are consistent with the EB model, although grades three and four are unusually large classrooms this school year.
4. The school has enough specialist teachers (e.g. art, music, PE) to allow for common planning and preparation time for grade-level teacher teams.
5. Time for professional development is embedded into the school schedule and after-school.

6. There is a focus on frequent data-driven interventions for students at risk of academic failure. Interventions are provided by a math resource teacher, two part-time RTI interventionists, the lead teacher, and the LEP and special education teachers for more severe needs. and
7. The school administers a number of assessments in addition to the state assessments. These are used to identify learning needs, monitor student progress, evaluate interventions, and to group and re-group students for instruction.

Chapter V: Fairmont Heights High School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

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Executive Summary

Fairmont High School is an example of the third category of schools – significant improvement in the performance of student subgroups.

Fairmont Heights High School is one of 30 high schools in the Prince George's County Public Schools (PGCPS) district. Fairmont Heights is divided into three academies that focus on general studies, information technology, or environmental studies.
In 2014, 86.3 percent of Fairmont Heights' students were African American, and 11.5 percent of the school's students were Latino. Nearly two-thirds (65.3 percent) of students were eligible for free or reduce-priced meals (FRPM), and 15.6 percent of the students were served in special education programs.

In recent years, performance of certain subgroups of students at Fairmont Heights has improved significantly. Specifically, from 2008 to 2013, the percentage of students who were proficient or advanced on the reading, mathematics, and science High School Assessments (HSAs) increased:

- 31 percentage points for students who were eligible for FRPM (42.3 percent to 73.6 percent);
- 31 percentage points for students in special education (4.5 percent to 35.6 percent); and
- 30 percentage points for non-white and non-Asian students (48.5 percent to 78.6 percent).[16]

Educators at Fairmont Heights work toward improving student performance in an environment marked by a focus on core subjects, the use of assessment and other student data to drive decision making, multiple academic supports for students, multiple behavioral supports for students, and supports for teachers' engagement in professional development. Specifically:

1. Focus on core subjects. The school's high proportion of core subject teachers indicates a commitment to these subjects and also contributes to a low average core class size.
2. Use of assessment and other student data to drive decision making. PGCPS has supported the school's adoption of the Data Wise system, which promotes in-depth use of student performance results to inform decisions about staffing, personnel organization, curriculum, and instruction.

[16] Differences were calculated using unrounded numbers.

3. Multiple academic supports for students. The school provides many types academic assistance to help students succeed. For instance, Fairmont Heights provides targeted supports to grade nine students in an effort to help them navigate the transition from middle school to high school. Across grades, students who have failed the English or mathematics state assessments can enroll in intervention courses to prepare them to take the exams again. The school also has a partnership with the Hillside after-school program so that participating students have access to tutoring and academic enrichment activities.
4. Multiple health and behavioral supports for students. Prince George's County Public Schools has initiated programs aimed at improving the quality of life for district residents, and Fairmont Heights has received support from these initiatives. As a community school under the district's Transforming Neighborhoods Initiative,[17] Fairmont Heights receives social work assistance from a community resource coordinator. The school is also the site of one of four district School-Based Wellness Centers; the on-site location of the wellness center allows Fairmont Heights students easy access to physical and mental healthcare.
5. Supports for teachers to engage in professional development. The district supports teachers' engagement in professional development by offering professional development opportunities, providing substitute teachers for educators who seek out their own forms of professional development, and setting aside professional development release days so that teachers can engage in ongoing learning without having to plan for an absence from their class.

Introduction

Fairmont Heights is one of 30 high schools in the Prince George's County Public Schools (PGCPS) district. Currently many students travel to school by bus. However, PGCPS is building a new facility for the school, and when the school moves into the new facility, many students will be able to walk to school. Parents of students at Fairmont Heights work for the government (federal, District of Columbia, or Prince George's district), the Metro, or in the retail or service sectors.

The school has a long history in the area. School staff members explain that it was among the first African American high schools in the Prince George's district, and it has an active alumni association that has over 10,000 members. According to staff, the alumni association works to raise funds for the school, provide scholarships to students, and support the school and students at school events.

Fairmont Heights High School is divided into academies: Hornet's Academy (a program of general studies), the Academy of Information Technology, and the Academy of Environmental Studies. Currently, the school also has a Biotechnology Academy; this academy no longer accepts new students

[17] Valli, L., Stefanski, A., & Jacobson, R. (2014). *School-community partnerships: A typology for guiding systemic educational reform.* College Park, MD: Maryland Equity Project, The University of Maryland.

and will cease to exist once current sophomores graduate. While it is not a formal program of study, the school also has what school staff call a "ninth grade academy" to provide extra support for students as they transition from middle school to high school.

In addition to these general education academies, the school also houses a Community Referenced Instruction (CRI) program. In the CRI program, students with severe special needs attend high school for six years. Three years of the program are geared toward helping students complete assessments necessary for high school graduation and the other three years are geared toward helping students gain career skills. This is a small program. According to staff, 10 students were enrolled in this program for the 2014-15 school year.

In 2014, 837 students were enrolled in Fairmont Heights (see Table1). In past years, enrollment at Fairmont Heights was higher due, in part, to a relatively large population of overage students. The current principal explains that the previous principal worked to reduce the number of overage students enrolled at Fairmont Heights by helping them enroll in job training programs and general education development (GED) programs. The current principal reports that the school enrolls fewer overage students than in the past.

Table 1
Fairmont Heights High School Grade-Level Enrollment and Core Class Size, 2014

Grade	Enrollment
Grade 9	259
Grade 10	237
Grade 11	198
Grade 12	143
Average core class size across grades	24.6

Source: Maryland Report Card; Personal communications with school staff

Most of the students at Fairmont Heights are African American, and a small percentage of students are Latino (see Table.2).

In 2014, 86.3 percent of Fairmont Heights' students were African American, and 11.5 percent were Latino. Nearly two-thirds of the students (65.3 percent) were FRPM, and 15.6 percent of students received special education services.

Table 2
Fairmont Heights High School Student Characteristics, 2014

Student Characteristics	Percentage of Fairmont Heights Student Population
Race/ethnicity	
American Indian/Alaska Native	-
Asian	-
Black/African American	86.3
Hispanic/Latino	11.5
Native Hawaiian/Pacific Islander	-
Two or more races	1.2
White	-
Limited English Proficient (LEPs)	-
Free and Reduced-Price Lunch	65.3
Special Education students	15.6

Source: Maryland Report Card (www.mdreportcard.org). A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

Student Performance

In recent years, performance of certain subgroups of students at Fairmont Heights has improved significantly (see Table 3).

Table 3
Fairmont Heights High School Performance, High School Assessments (HSA), 2008-2013

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science						
Performance Level	**HSA 2008**	**HAS 2009**	**HAS 2010**	**HAS 2011**	**HSA 2012**	**HSA 2013**
All Students	50	57	53	62	69	79
FRPM Students	42	52	55	54	69	74
LEP Students	-	-	-	-	-	-
Students with Special Needs	5	Missing	19	11	26	36
Non-White/ Non-Asian Students	49	56	53	62	69	79

Source: Data provided by the Maryland State Department of Education (MSDE). A "-" indicates too few students in the category to report scores.

Specifically, from 2008 to 2013, the percentage of students who were proficient or advanced on the High School Assessments (HSA) increased:

- 32 percentage points for students who were eligible for FRPM students (42 percent to 74 percent);
- 31 percentage points for special education students (5 percent to 36 percent); and
- 30 percentage points for non-white and non-Asian students (49 percent to 79 percent).

This case report examines the resources that the school uses as it works toward improved student achievement. The report has 11 sections: 1) school performance, 2) staff, 3) goals, 4) schedule, 5) curriculum and instruction, 6) assessments, 7) interventions, 8) professional development, 9) culture, 10) summary, and 11) alignment with the evidence-based model. These sections of the report draw upon information from two main sources: a review of documents provided by school staff or available online, and individual and focus group interviews with school staff (school administrators, instructional staff, and support staff) that occurred in February 2015.

School Staff

The Fairmont Heights staff includes administrators, teachers and aides who work in the main program and special education programs, and several pupil support personnel. Table 4 presents the number of full-time equivalent (FTE) staff by category working in Fairmont Heights.

Table 4
Staffing in Fairmont Heights High School, 2014-15

Category	FTE
Administration	
Principal	1
Assistant Principal	3
Athletic Director	0.5
Testing Coordinator	1
Special Education Program Coordinator	1
Student Accountability Administrator	1
Clerical, Business, Scheduling, and Technical Support	6
Main Program	
Core Teacher	34
Elective Teacher	14.5
Special Education Self-Contained	1
Special Education	2
Aides	
Special Education Paraprofessional	1
Itinerant Special Education Assistant	3

Category	FTE
Special Education (Self-Contained) Paraprofessional	2
Dedicated Special Education Aide	4
Pupil Support	
Guidance Counselor	3
Nurse	1
School-Based Wellness Center Personnel	2
Community Resource Coordinator/Social Worker	1
Speech and Language Therapist	0.6
Psychologist	0.2
Vision and Hearing Specialist	0.03
Other Pupil Support	1
Security	3
Cafeteria Manager	1
Custodial Staff	2

School administration includes a principal, who began working at Fairmont Heights in 2012 as a resident administrator under the New Leaders initiative.[18] The principal is joined by three assistant principals, an athletic director (who splits time between this role and teaching), a student accountability administrator, the coordinator of the school's special education services, and a testing/data coordinator. Several staff members help operate the school by performing clerical or administrative assistance, business, scheduling, and technical support roles.

Fairmont Heights has 34 teachers who teach in one of the core subject areas of English/language arts, mathematics, social studies, science, and world languages. Given a student enrollment of 837 students in 2014-15, the average core class size is approximately 25 students. Fairmont Heights also employs 14.5 elective teachers who provide instruction in subjects such as art, music, drama, Junior Reserve Officer Training Corps (JROTC), physical education, business education, and information technology. According to school personnel, several teachers came to the school through the Teach for America program. Many teachers serve as department chairs, and three teachers in the school serve as professional development lead teachers. Department chairs and professional development lead teachers carry full teaching loads and therefore perform chair and lead teacher duties as an addition to their instructional responsibilities.

Two special education teachers provide co-teaching support within the general education program. One special education paraprofessional also works in the general education program, and three itinerant

[18] The previous school principal, who worked at Fairmont Heights for four years, also came to the school through the New Leaders program.

special education assistants float to different classes within the general education program to assist on an as-needed basis. The school's CRI program, the self-contained program for students with severe special needs, has a lead resource teacher and two paraprofessional educators. Four dedicated aides work one-on-one with particular students.

The school has three guidance counselors. These counselors provide a variety of services to students, including assistance with course registration, assistance with registration for college placement exams, filling out Free Application for Federal Student Aid (FAFSA) paperwork, seeking scholarships for postsecondary education, and bringing students to a district-run college and career day.

The school receives support through Prince George's County Public Schools' Transforming Neighborhoods Initiative, making Fairmont Heights a community school.[19] Through this initiative, the school employs a community resource coordinator who works year-round to address issues in the school and community such as child abuse, homelessness, food vouchers, pregnancy and other health concerns, and educational challenges. Fairmont Heights is also the site of one of the district's four School-Based Wellness Centers, and staff members at that site provide medical services to students at the school.

Some personnel serve multiple schools in the district. During the 2014-15 school year, a psychologist comes to Fairmont Heights one day a week, a speech and language therapist is at the school three days a week, and vision and hearing specialists are at the school once a month. The school can request the services of an occupational therapist, but it does not need this person to visit the school on a regular basis.

As shown in Table4 and outlined in the preceding paragraphs, Fairmont Heights has access to a wide variety of human resources, including: (a) administrators who focus on different aspects of school operations; (b) teachers of English/language arts, mathematics, science, social studies, and world languages; (c) teachers who teach elective courses in the general education program, the academies, and for the JROTC program; (d) several different types of special education teachers and aides; (e) guidance counselors; and (f) personnel who support the physical and mental health of Fairmont Heights students.

School Goals

According the school website, the vision of the school is to "continually ignite curiosity and facilitate habits of the mind, which create globally contributing citizens." The school's mission is to "empower students to become lifelong learners dedicated to achieving academic excellence and becoming active

[19] For more information on the Transforming Neighborhoods Initiative, see http://www.princegeorgesdistrictmd.gov/sites/ExecutiveBranch/CommunityEngagement/TransformingNeighborhoods/Pages/default.aspx.

members in a global community that exemplifies duty, honor, and citizenship." References to the vision and mission of the school are evident in communications between school administrators and families (e.g. letters to welcome students to school at the beginning of the school year).

According to the school principal, the school's goal is to use data to improve how the school operates and, ultimately, to increase student performance. Like many other PGCPS schools, Fairmont Heights has begun to use Harvard Graduate School of Education's Data Wise program. According to the Data Wise website, the program encourages educators to engage in eight steps that will help them use data to improve student achievement. The steps are to "organize for collaborative work; build assessment literacy; create data overview; dig into student data; examine instruction; develop action plan; plan to assess progress; [and] act and assess."[20]

The school principal says that the staff uses the program to schedule students into classes, schedule teachers for classes and organize teachers into groups, and analyze student data to monitor and improve school performance. Goals that stem from the Data Wise program cover many aspects of school operations. For instance, the principal says that one goal is to keep class sizes low; her goal is 25 or fewer students in core classes and between 35 and 40 students in elective classes.

In addition to the goals of improved student performance, school staff also report goals regarding the school's presence in the community. The school principal explains that school performance declined in the past decades and, as a result, community members sometimes express negative perceptions of the school. One of the principal's main goals is to highlight the school's successes and help community members see the ways in which the school has improved in recent years.

School Schedule

Fairmont Heights utilizes a block schedule. Students at Fairmont Heights begin their day at 8:30 a.m. and attend four class periods each day. The first two periods each last one hour and 30 minutes. The third period, which includes a 30-minute lunch period, is two hours long. The last period of the day is one hour and 25 minutes. Students end their school day at 3:10 p.m. Teachers instruct for three periods and have one period for planning.[21]

Each student has a conference with school administrators prior to enrolling in grade nine at Fairmont Heights. This conference provides school staff, students, and their parents the opportunity to discuss any academic or behavioral issues that the student may face, describe the supports available at Fairmont Heights, and create plans to address potential issues. These conferences also allow school staff

[20] These steps are located on the Data Wise website at http://isites.harvard.edu/icb/icb.do?keyword=datawise&pageid=icb.page547509.

[21] Professional development lead teachers and department chairs, who carry full teaching loads, may use non-teaching periods to perform lead teacher or chair work rather than as a planning period.

to get an understanding of students' academic background and level of preparedness for high school courses.

The school's guidance counselors assign students to classes. Fairmont Heights offers standard, honors, and Advanced Placement (AP) courses in English; standard and AP mathematics courses; standard and AP history/social studies courses; and standard, honors, and AP science courses. Students need approval from a teacher to register for honors and AP courses.

Students in the Biotechnology, Information Technology, and Environmental Science Academies generally move as cohorts. That is, these students attend core classes and academy-specific courses together but other electives with students from throughout the general education population.

Curriculum and Instruction

As noted in the introduction, the general education program at Fairmont Heights contains Hornets' Academy (a general program of study), an Academy of Information Technology (some funding for which came from the U.S. Department of Education), an Academy of Environmental Sciences, and (for only a few more years) an Academy of Biotechnology. Students in all academies are required to take classes in the core subjects of English/language arts, mathematics, science, social studies, and world languages.[22] Students enrolled in the Academy of Information Technology, the Academy of Environmental Sciences, and the Academy of Biotechnology are required to take academy-specific courses. All students are required to supplement core courses with electives, which include advanced or specialized offerings in English/language arts, mathematics, social studies, science, and world languages as well as offerings in the arts, business, JROTC, health and physical education, technology, and engineering. Students can also earn college credit through dual enrollment agreements with Prince George's Community College and Bowie State University.

Fairmont Heights' teachers use district-recommended textbooks. For instance, English/language arts teachers use online textbooks obtained through Holt McDougal, and mathematics courses use Glencoe textbooks for algebra. The district provides pacing guides and a curriculum for all subjects, which teachers at Fairmont Heights supplement with materials they gather from a variety of sources. Across subjects, the curriculum is changing due to the transition to the state's new College and Career-Ready standards.

Teachers at Fairmont Heights use a variety of instructional techniques and resources. Some teachers throughout the school have integrated technology into their instruction. Particularly due to the school's

[22] School documents outline that students must take four years of English/language arts and mathematics. While students are only required to take three years of science and social studies, they have the option to take a fourth year of these core courses as an elective. Similarly, while students are only required to take two years of world languages, they have the option to take two more years as elective courses. The school also requires that students take some credits in fitness/health, fine arts, and technology.

information technology program, teachers and students throughout the school have access to resources such as tablets and computers. Some classrooms have interactive whiteboards, and some teachers report that they encourage their students to use their own technology (such as their phones) in the classroom setting in order to access instructional materials.

In sum, Fairmont Heights has multiple resources to implement its curricular and instructional programs. First, the school requires a teaching staff capable of delivering instruction in the core subjects and electives (academy-specific and other). Teachers at the school require textbooks and time to find additional resources to supplement the text. They also need time to become familiar with the College and Career-Ready standards and find materials that support its implementation. Many teachers at Fairmont Heights have embraced technology for instruction; these teachers use materials such as computers, tablets, and interactive whiteboards.

Assessments

Students at Fairmont Heights take a variety of tests for different purposes. The following paragraphs outline four categories of assessments.

First, like their colleagues throughout PGCPS, teachers at Fairmont Heights are evaluated, in part, based on their ability to meet student learning objectives (SLOs). Thus, students take pre- and post-assessments that provide data for teachers' SLOs. Some tests for SLOs come from the district, while others are teacher-created.

Second, students at Fairmont Heights take benchmark assessments. Students take district-level benchmark tests on a quarterly basis; these tests include the Mandatory Unit Systemic Test (MUST) and the Formative Assessment Systems Test (FAST) assessments.

Third, students take tests to measure their mastery of course content. In some cases, these unit exams come from the district, but in other cases, teachers themselves create unit tests. In still other cases, teachers use commercially available assessments. For instance, English/language arts teachers have access to online assessments through the online textbook system. The extent to which teachers themselves create unit tests may have increased this year, due to the shift to the new state standards. For example, while algebra teachers had access to district-created common assessments last year, they needed to create their own unit tests this year, which reduces comparability across classrooms and schools. Teachers in non-tested subjects typically create their own tests, which they base on the district curriculum.

Fourth, students also take state assessments. In past years, high school students in Maryland took the High School Assessments (HSA) in English, algebra, government, and biology. Students need to take and pass each of these assessments at some point during their high school career in order to obtain a high school diploma. Beginning in spring 2015, students will take Partnership for Assessment of Readiness for

College and Careers (PARCC) assessments in English and algebra;[23] government and biology tests, however, will still follow the HSA format.

As discussed above in the section on school goals, the staff at Fairmont Heights follows the steps in the Data Wise program to analyze results from these varied assessments. Administrators, a data coordinator, and teachers work together to implement the Data Wise program. According to the principal, school staff review benchmark data, identify trends in student performance, and make decisions about curriculum, instruction, and the organization of teacher teams. Periodically, the school engages teachers in full-day data analytic sessions; on these days, substitute teachers cover classes so that teachers can spend the day taking a close look at student performance.

The school uses several resources for assessment. In addition to the assessments themselves, the school has access to the Data Wise program and a data coordinator to assist with program implementation. Finally, the school needs time to allow teachers, administrators, and the data coordinator to analyze the data and use them to shape curriculum and instruction.

Interventions

Students at Fairmont Heights have access to a variety of interventions, some of which focus on academics and some on health, wellness, and behavior.

Academic

In an effort to provide extra support to students as they transition from middle school to high school, the school has begun to pay special attention to grade nine students. In addition to the grade nine academy, where students have access to a cohort-like environment, the school uses an early warning system to track the progress of grade eight students who will enter the school. The district-provided early warning system, which keeps track of indicators such as reading and mathematics performance, attendance, and discipline data, flags students who may need extra supports when they enter the high school environment. When the system flags a student as needing extra support, the school works with the student's parents to create a plan that may include daily check-ins, a mentor, extra support from a guidance counselor, conferences with parents, afterschool study hall sessions, or enrollment in the other support programs.

According to the school principal, Fairmont Heights works with a feeder middle school to bring overage grade eight students to the high school so that these students can make up their course credit in the high school environment. Additionally, when possible, the school refers overage grade nine students to an alternative school in the district to make up course credit; the school then accepts these students

[23] Passing scores on the PARCC English and algebra assessments are not graduation requirements for students who initially take the exams during the 2014-15 or 2015-16 academic years. For more information, see http://www.marylandpublicschools.org/w/Top5HSTesting0214.pdf.

back at grade 10. Due to resource shortages, however, the school does not refer all overage grade nine students to the alternative school.

Across grades, educators at Fairmont Heights provide multiple supports to students within the school day. For instance, particular students who demonstrate ongoing academic challenges are referred to a team of school staff who devise an individualized support plan for that student. Additionally, the school offers semester-long intervention elective courses for students who have taken but not yet passed the English or mathematics state exams. Furthermore, in addition to in-class supports of co-teachers or paraprofessionals, the school offers a resource course for special education students and, for some special education students, provides intensive courses for core subjects.

The school also has after-school supports for students who struggle academically. While Fairmont Heights does not have a school-wide, formal tutoring program, some teachers do tutor students after-school. Additionally, Fairmont Heights is one of four PGCPS high schools to participate in the Hillside Work-Scholarship Connection program. The Hillside program, created and supported by Wegmans grocery store, provides compensatory education students supports including tutors and advocates, extracurricular life skills enrichment courses, college information and tours, and job training.[24] The principal reports that this program is so popular among students it has a waiting list, since interest in the program exceeds available slots.

Fairmont Heights' students also have access to extracurricular activities that can enhance their academic experiences. These experiences, while not targeted toward students at risk of academic failure, may help students succeed in secondary school and beyond. First, some Fairmont Heights students participate in federally funded Upward Bound programs at Howard University and the University of Maryland. These Upward Bound programs help students prepare for postsecondary education by offering academic supports as well as help filling out college applications and student aid forms. Second, the school operates a JROTC program, which receives a large portion of its funding from the U.S. Department of Defense and usually serves about 225 students in the school. While all students in the school are welcome to take JROTC courses, only those students who attend summer programs and pass

[24] According to the Hillside program website (https://www.hillside.com/about-us/family-agencies/hwsc/hwsc-who-we-are/), students with two of the following characteristics may be eligible for the program:

- "School attendance between 71 percent and percent;
- overage for grade-level;
- failing grade in core subjects;
- multiple school suspensions;
- low standardized test scores; and
- low socioeconomic status."

a series of tests become cadets. Third, teachers in the school operate a Saturday program to help prepare students for AP exams.

In sum, key resources in the provision of academic supports include (a) access to data on student performance in order to identify students who may need extra help; (b) collaboration among school staff to recommend supports for students who are particularly struggling; (c) in-school interventions for both general and special education students; and (d) out-of-school programs, some of which are funded by the school and some of which receive external support.

Health, Wellness, and Behavioral

Fairmont Heights is one of four high schools in Prince George's County Public Schools to house a district-supported School-Based Wellness Center, which school staff say is highly-utilized by students. According to the Prince George's district government website, this center offers "[c]omprehensive health and social services … in a student-friendly, readily accessible school health center… The goal is to make students available for learning by promoting health, preventing disease, and reducing behavioral risks. The Wellness Centers provide care to youth currently enrolled in each school that minimizes the physical and emotional conditions that become barriers to optimal school performance. Student health services include:

- Physical examinations;
- lab testing;
- mental health counseling;
- treatment of common illnesses;
- gynecological care;
- on-site screening/treatment of sexually [transmitted infections];
- dental care; and
- immunizations."[25]

In addition to the School-Based Wellness Center, the school has other resources to address health, education, and behavior issues. For instance, the community resource coordinator for the Transforming Neighborhoods Initiative assists students who are struggling with a variety of issues. Additionally, in the same way that teams of teachers might recommend supports for students who persistently struggle academically, teacher teams may recommend supports for students who face ongoing behavior challenges. The school also operates a student accountability center (SAC) for students to serve in-school suspensions. Finally, the guidance department can refer students to placements in alternative schools if the school environment at Fairmont Heights is not a good fit for them.

[25] Information about the School-Based Wellness Centers in Prince George's district can be found at http://www.princegeorgesdistrictmd.gov/sites/Health/Services/HealthServices/Adolescents/Pages/SBWC.aspx.

Many of the resources that the school uses to ensure the health, wellness, and behavioral success of students come from the district's School-Based Wellness Center and Transforming Neighborhoods Initiative. Resources that support these initiatives are in addition to the per pupil allocation the school receives. Some supports, however, are located at the school-level; in these cases, teachers, guidance counselors, and school accountability personnel provide behavioral support to students.

Professional Development

Teachers at Fairmont Heights participate in many different kinds of professional development. Professional development lead teachers and department chairs, who themselves carry teaching loads, learn about professional development opportunities and pass them along to their colleagues. Additionally, teachers may seek professional development on their own. These opportunities range from district-delivered professional development (including cross-school content area meetings) to continuing education (including pursuing a master's degree). Teacher-directed professional development occurs after-school, on weekends, and during the summer time; teachers who engage in professional development during school time have access to substitute teachers to cover their classes, and the district calendar includes a few professional development release days each semester.

Within the school, administrators, professional development lead teachers, and department chairs offer professional development to teachers. Most school-based professional development is for the entire staff, though some school-based professional development opportunities are broken out by content area. These sessions include activities such as data analysis, relationship-building (especially staff-to-student relationships), and navigating the shift to the College and Career-Ready standards.

Teachers have 90 minutes of planning time each day.[26] According to the school's master scheduler, teachers in the same department have planning periods at the same time. The extent to which teachers plan collaboratively varies. While some teachers use a portion of their planning time to work with colleagues, other teachers choose to work independently. Whether during common planning time or after-school, some departments meet with each other to discuss subject-specific curricular and instructional issues. Specifically, the entire English/language arts department meets once per month and smaller English/language arts sub-groups (such as English teachers in the same grade) meet as often as once per week. The whole mathematics department meets once a month and math teacher subgroups meet once or twice each month.

The main resources that educators at Fairmont Heights use for professional development include release time (either from substitute teachers or in the form of professional development days) and access to information about available professional development opportunities.

[26] As noted above in the section on the school schedule, professional development lead teachers and department chairs may use this time not for planning but rather to perform their additional responsibilities.

School Culture

According to staff, students at Fairmont Heights face many challenges outside of school, such as poverty, family instability, and crime. Teachers at the school explain that neighborhood problems can sometimes lead to problems at school and can serve as obstacles to learning. Perhaps due at least in part to these challenges, some teachers say that Fairmont Heights has a negative reputation in the community.

Because many Fairmont Heights students confront challenging circumstances, teachers explain that their ability to form caring relationships with students is crucial. Teachers say that they respect and care for each other and their students. They want to support their students, invest in them, and demonstrate that they are worthy of care. Caring relationships provide students necessary emotional support; additionally, student trust in and reliance on teachers provide the foundation for meaningful learning experiences. The principal of the school reports that since she expects teachers to build caring relationships with students, relationship-building is often the focus of professional development.

Some teachers at Fairmont Heights noted that student troubles still exist, and there are occasions when conflict between students and staff or among students themselves occurs. Still, teachers say that students are responsive to teachers who care about them and appreciate the supportive learning environment that stems from an atmosphere of caring relationships. One teacher noted that the culture at Fairmont Heights is marked by both "shame and pride"; while members of the school community may feel shame associated with the challenges associated with poverty, family instability, and crime, they are proud of their school community and their ability to overcome adversity.

Summary

In recent years, the academic performance of certain subgroups of students at Fairmont Heights has improved by a significant amount, with the percentage of students scoring proficient or above on the HSA who are low income, receiving special education services, or are of racial or ethnic minorities all improving by 30 percentage points or more.[27]

Educators at Fairmont Heights work toward improving student performance in an environment marked by a focus on core subjects, the use of assessment and other student data to drive decision making, multiple academic supports for students, multiple behavioral supports for students, and supports for teachers' engagement in professional development. Specifically:

1. Focus on core subjects. The school's high proportion of core subject teachers indicates a commitment to these subjects and also contributes to a low average core class size.
2. Use of assessment and other student data to drive decision making. PGCPS has supported the school's adoption of the Data Wise system, which promotes in-depth use of student

[27] Differences were calculated using unrounded numbers.

performance results to inform decisions about staffing, personnel organization, curriculum, and instruction.

3. Multiple academic supports for students. The school provides many types academic assistance to help students succeed. For instance, Fairmont Heights provides targeted supports to grade nine students in an effort to help them navigate the transition from middle school to high school. Across grades, students who have failed the English or mathematics state assessments can enroll in intervention courses to prepare them to take the exams again. The school also has a partnership with the Hillside after-school program so that participating students have access to tutoring and academic enrichment activities.
4. Multiple health and behavioral supports for students. Prince George's County Public Schools has initiated programs aimed at improving the quality of life for district residents, and Fairmont Heights has received support from these initiatives. As a community school under the district's Transforming Neighborhoods Initiative,[28] Fairmont Heights receives social work assistance from a community resource coordinator. The school is also the site of one of four district School-Based Wellness Centers. The on-site location of the wellness center allows Fairmont Heights' students easy access to physical and mental healthcare.
5. Supports for teachers' engagement in professional development. The district supports teachers' engagement in professional development by offering professional development opportunities, providing substitute teachers for educators who seek out their own forms of professional development, and setting aside professional development release days so that teachers can engage in ongoing learning without having to plan for an absence from their class.

Alignment with the Evidence-Based Model

The most notable ways in which Fairmont Heights aligns with the evidence-based (EB) model are through (a) staffing the school with the EB-recommended ratio of core to elective teachers and implementing small core class sizes, (b) engaging in data-based decision making, and (c) providing extra help for students at risk of academic failure.

1. Following the EB-recommended core to elective teacher ratio and implementing small core class sizes. Just over two-thirds of the school's teachers (34 teachers) teach in one of the core subject areas of English/language arts, mathematics, science, social studies and world languages, and just under one-third of the school's teachers (14.5) teach an elective subject. This ratio aligns very closely with the EB model recommendations for core and elective teachers in high schools. Furthermore, based on the number of core educators, class sizes in core subjects are 24.6

[28] Valli, L., Stefanski, A., & Jacobson, R. (2014). *School-community partnerships: A typology for guiding systemic educational reform.* College Park, MD: Maryland Equity Project, The University of Maryland.

students, very close to the EB model's recommended 25 students. This small core class size also aligns with one of the identified school goals; the principal's aim is to enroll 25 students in core courses and 35 to 40 students in elective courses.

2. Engaging in data-based decision making. The school's use of the Data Wise program indicates a willingness to pay serious attention to student performance and to use data to inform decisions regarding staffing, how to organize teachers into collaborative or departmental groups, and how to proceed with curriculum and instruction. Staff at the school dedicate time and effort into analyzing data, which they do with assistance from the school's administration and data coordinator.
3. Providing extra help for students at risk of academic failure. Fairmont Heights provides multiple supports for students at risk of academic failure. The school offers intervention courses for students who have struggled to pass the English and math state tests. It also offers a resource course for special education students and intensive core courses for those special educations students who would benefit from specialized instruction. Additionally, through the school's partnership with the Hillside program, students at Fairmont Heights can access after-school tutoring and other support, and through partnerships with Prince George's County Public Schools, students at Fairmont Heights can access physical and mental healthcare.

While the school aligns with the EB model in these ways, there are ways in which it diverges from the model. Two areas in particular are noteworthy. First, the number of administrators at Fairmont Heights is greater than the recommendations in the EB model. Second, the EB model recommends that schools employ instructional coaches who can support teachers' work. While Fairmont Heights does have professional development lead teachers and department chairs, these educators carry teaching loads; therefore, teachers at Fairmont Heights do not have access to non-teaching instructional coaches.

Despite areas in which Fairmont Heights does not align with the EB model, the school has access to resources that go beyond those recommended by the EB model, which only addresses academic resources. These include resources that support both the Transforming Neighborhood Initiative and the School-Based Wellness Center. These additional resources reflect a school community model and represent a broader approach to addressing both educational and community challenges.

In sum, there are some ways in which the resources to which educators at Fairmont Heights have access align with the EB model. In other ways, their available resources do not match EB recommendations, and increased access to certain resources (such as, perhaps, non-teaching instructional coaches) may assist educators at Fairmont Heights as they continue to work toward improved student performance.

Chapter VI: James H. Harrison Elementary School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

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Executive Summary

James H. Harrison Elementary School is an example of the third category of schools – significantly improving achievement for subgroups of students.

James H. Harrison Elementary School is nestled in the middle of an apartment complex in the Laurel area of Prince George's County Public Schools. The school enrolls a diverse population of 330 students – 32 percent are Hispanic, 52 percent are African-American, 9 percent are Asian, and 6 percent are white. Seventy percent of students are eligible for free and reduced-price meals (FRPM).

Between 2007 and 2012, Harrison saw consistent gains in student achievement on the Maryland State Assessment (MSA). In particular, the MSA scores of all students increased by 34 percentage points between 2007 and 2012, from 46 to 80 percent. The test score gains of FRPM students rose from 47 to 77 percent proficient and advanced. The test score gains for special education students (52 percentage points) and limited English proficient (LEP) students (52 percentage points) were larger. These statistics are notable given the persistently large academic achievement gaps often seen for these subgroups.

Interviews with staff members and the principal point to four factors that have contributed to these increases in student achievement:

1. Data-driven decision making. The principal and teachers use data from a myriad of student assessments to undertake focused instructional practices. Teachers use data from assessments to inform instruction in three primary ways: to group students, to identify students in need of intervention or referral, and to determine concepts that require re-teaching.
2. Multiple interventions. Multiple interventions have been implemented at Harrison to support students who are struggling academically. These include commercial programs such as iReady, iStation, Fasst Math, First in Math, and Study Island. LEP students receive tutoring after-school. Harrison has two programs for special education students – the Comprehensive Special Education Program (CSEP) is a self-contained model of small classrooms, and the Community Referenced Instruction (CRI) program, which is for students with severe cognitive disabilities and is focused on developing functional life skills. These programs enroll students from across the district. Response to Intervention (RTI) is also used to provide research-based and targeted interventions (such as small group instruction) to support students with learning or behavioral challenges.
3. Use of elective teachers and specialists to support classroom instruction. The principal leverages the school's elective teachers (physical education and music) to supplement classroom instruction. They have "specific responsibilities around the school-wide goals" such as teaching basic math facts. These teachers "can't monitor work [but can] drill students and give them [Tiger] paws," rewards that can be used in the school store. Moreover, elective teachers provide push-in support in the classroom via twice weekly 30-minute small group sessions focused on boosting student performance in math and also provide support outside of the classroom.

4. School leadership. The principal has been purposeful in communicating her expectations to staff and providing support and guidance on their deliberate and intentional instructional practices that makes a positive impact as evidenced by student data. She sends a weekly "Week at a Glance" email that includes strategies for aligning instructional practices with particular areas of focus, such as the new Partnership for Assessment of Readiness for College and Careers (PARCC) assessments. The principal uses resources strategically to benefit students – such as pulling in elective teachers to supplement classroom instruction.

Introduction

James H. Harrison Elementary School is located in the City of Laurel in the Prince George's County Public Schools district. The school is located in the middle of an apartment complex. In spring 2015, Harrison enrolled 330 students in prekindergarten through grade six. There are two half-day prekindergarten classes and one classroom per grade-level. Overall, core class sizes averaged 24 students, with average class sizes by grade-level displayed in Table 1. Class size estimates include students from the Comprehensive Special Education Program (CSEP), described below.

Table 1
James H. Harrison Elementary School Class Sizes

Grade-Level	Class Size
Prekindergarten	12
Kindergarten	25
Grade One	25
Grade Two	25
Grade Three	25
Grade Four	30
Grade Five	30
Grade Six	25

Harrison is a small school that serves three populations of students. It has a general education program that enrolls 220 students from the neighborhood. In addition, Harrison has two specialized special education programs that enroll a total of 110 students from across the district.

The CSEP is a self-contained model with small class sizes (10-12 students) that has elements of inclusion. For example, students in the CSEP program at Harrison attend elective classes, such as physical education and music, with students in the general education program, as well as receive instruction as per their individualized education program (IEP) in the general education classroom with support. The Community Referenced Instruction (CRI) program enrolls students with severe cognitive disabilities and focuses on developing functional life skills. One-third of the school's students are enrolled in either the CSEP or CRI program.

The school serves a diverse student population: 52 percent African-American, 32 percent Hispanic, 9 percent Asian, and 6 percent white. The school used to be predominantly African-American but the Hispanic population has been on the rise since 2011.

The student population is "very transient" due in part to special education students who are newly placed into the programs or who test out of special education and go back to their neighborhood schools. Additionally, the school sits "in the middle of an apartment complex" that houses a transient population. The school's enrollment "fluctuate[s] between 305 and 330 all year long," according to the principal.

Seventy percent of students qualify for FRPM, which is the same as the district's average. Sixteen percent of students are LEP, which is lower than the district's average of 21 percent.[29] Harrison has a much higher rate of student's receiving special education services (32 percent) than the district's average (10 percent) due to the CSEP and CRI programs.

The number of students attending Harrison by student subgroup is shown in Table 2.

Table 2
James H. Harrison Elementary School Student Characteristics

Student Characteristics	Percentage of Harrison Student Population
Race/Ethnicity	
American Indian/Alaska Native	-
Asian	9
Black/African American	52
Hispanic/Latino	32
Native Hawaiian/Pacific Islander	-
White	6
Two or more races	-
Eligible for free or reduce-priced meals (FRPM)	70
Limited English Proficient (LEP) students	16
Special education students	32

*A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

[29] The district rates presented are for elementary schools only.

Since 2007, Harrison Elementary has demonstrated consistent improvement in student achievement across the entire school population and for subgroups. This case investigates how Harrison achieved the observed growth in student achievement. The report has 11 sections: (1) school performance, (2) school staffing, (3) goals, (4) school schedule and collaborative teams, (5) curriculum and instructional program, (6) assessments, (7) interventions and supports, (8) professional development, (9) school culture and leadership, (10) summary, and (11) degree of alignment between the school's strategies and the school improvement strategies embedded in the EB funding model.

School Performance

Table 3 shows the composite data used to select Harrison as a case study site. The percentage of students who are proficient or advanced across all subjects (reading and math in grades three through five, and science in grade five) was averaged to produce a number – percent proficient/advanced – for each year from 2007 to 2012. For 2013 and 2014, only the "All Students" scores were available. During this latter two-year time period, the state's curriculum standards changed, but the test did not. Statewide test score results dropped over these two years. Schools that had a drop of less than one standard deviation were given preference for selection as a case study. Harrison's composite test scores did drop in 2013 to 67 percent, but increased to 70 percent in 2014.

Table 3
James H. Harrison Elementary School Performance, Maryland School Assessment (MSA), 2007-2014

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	46	63	60	69	78	80	67	70
Free and Reduce-priced Meals (FRPM) Students	47	63	53	66	78	77	NA	NA
LEP Students	22	53	-	55	67	75	NA	NA
Special Education Students	18	30	32	44	60	70	NA	NA
Non-White/ Non-Asian Students	47	66	60	68	77	79	NA	NA

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

As shown in Table 3, the percentage of all students scoring proficient or advanced on the MSA increased by 24 percentage points between 2007 and 2012. The test score gains of special education students (52 percentage points) and LEP students (53 percentage points) were larger; and minority students scores

increased by 32 percentage points. These statistics are notable given the persistently large academic achievement gaps often seen for these subgroups.

This case tells the story of how Harrison produced these improvements in student performance. It draws on interviews with the school principal and classroom teachers. Documents, such as the school schedule and school improvement plan were provided by the principal and supplemented with materials available on the Prince George's County Public Schools (PGCPS) and Maryland State Report Card websites.

School Staffing

The principal has been leading the school since 2010. During her first two years at Harrison, teacher turnover was high as many teachers departed to work at the former principal's new school. The last two years have been more stable and only two or three teachers have left the school.

PGCPS manages the hiring process centrally. Teachers are recruited at PGCPS job fairs – the interviews take place here too. However, PGCPS has a student based budgeting (SBB) funding model that allows principals some discretion in selecting positions they would like staffed in their schools. There are certain positions that are required by the district, such as the school principal or prekindergarten positions, which means that all schools must staff these positions. There are other positions that are discretionary, such as assistant principals, and reading specialists, which means that principals have autonomy to decide whether or not to staff these positions. Principal autonomy is constrained by their SBB budget allocation and principals must make strategic decisions about which positions will best leverage and support the school's goals and related initiatives.

Harrison is a small school; its initial SBB allocation for fiscal year 2015 was $1.08 million. The district placed an assistant principal [at no cost to the school's budget] in the school during the 2014-15 school year to provide additional administrative support – a position that the principal characterized as "essential to monitor the instructional practices" of teachers in the building. The assistant principal conducts the observations required for teacher evaluations, but does not provide teachers with direct coaching. In the coming school year, this position will likely come out of the school's budget.

Table 4 shows the school's staff by full-time equivalent (FTE) positions. Harrison's administration includes a principal, an assistant principal, and a CSEP Coordinator. The school has a small clerical staff consisting of a records secretary, principal's secretary, and special education clerk typist.

Table 4
Staffing in James H. Harrison Elementary School

Category	FTE
Administration	
Principal	1.0
Assistant Principal	1.0
CSEP Coordinator	1.0
Clerical/Support Staff	
School Secretaries	3.0
Building Maintenance	3.0
Parent Outreach Coordinator	1.0
Main Program	
Core Teachers	11.0
Specials Teachers (Music, Art, PE)	2.2
Instructional Lead Teacher	1.0
Special Education (CSEP Program)	7.0
Special Education (CRI Program)	3.0
Special Education Resource	2.0
LEP Teachers	1.0
Media Specialist	0.5
Reading Specialist	1.0
Crisis Intervention Resource Teacher	1.0
Educational Assistants	
Paraprofessional	2.0
Special Education Paraprofessional	10.0
Itinerant Special Education Assistant	2.0
LEP Paraprofessional	1.0
Pupil Support	
Licensed	
Counselors	1.0
School Psychologist	1.0
Nurse	1.0
Speech Pathologist	1.3
Occupational Therapist	1.0
Motor Teacher	0.5
Non-licensed	
Lunchroom Staff: Manager, Workers and Aide	3.0

The staffing arrangement highlights not only the core teaching positions, but illustrates the role that specialists and paraprofessionals play in supporting student learning, in particular for CSEP and CRI students.

First, as Table 4 shows, the school has 11 core teacher positions for the 220 (out of a total school enrollment of 330) students in prekindergarten through grade six general education program, which translates into an average class size of 20. That is smaller than estimated earlier in this report), which included CSEP students who attend classes offered in the mainstream program. The general education program has two paraprofessionals – one provides assistance with the school's transition to the new PARCC assessment and the other provides instructional support in the school's larger classes.

The CSEP program has one class per grade for a total of seven classrooms. There is one special education teacher for each classroom. The CRI program has three classrooms that are mixed grades (kindergarten and grade one, grades two and three, and grades four through six); there is one teacher for each classroom. All special education classes have a dedicated paraprofessional. Additionally, the school employs two Itinerant special education assistants who provide personal care, learning and behavioral support to special education students. Specialists such as occupational therapists, a speech pathologist, and a motor skills teacher are also on staff to support students in this program. Assuming a six-period day with teachers providing instruction for five of those periods, a standard formula for determining the number of elective teachers is to have the number of elective teachers equal to 20 percent of the number of core teachers, which would equal 2.2 positions for this school (0.2 x 11). The total at Harrison is 2.2 FTE.

Harrison has one instructional lead teacher (ILT) who provides coaching and professional development to teachers. She is available to answer questions about the curriculum and classroom instruction. The principal described the ILT as "the go-between between administrators and teachers to facilitate the execution of teacher practice." However, since the school's funding allocation does not provide money for both an assistant principal and instructional lead teacher, the principal indicated that she would have to decide which position to retain for the 2015-16 school year.

The crisis intervention resource teacher is charged with helping staff members and school administrators manage behavior of special education students. This includes developing behavior intervention plans and providing teachers with professional development on behavior intervention strategies. The school counselor also provides support to students who "are having behavioral difficulties" and helps teachers "diffuse behavioral issues in the classroom." Since he speaks Spanish, the counselor also works with Spanish-speaking parents to "apprise them of the intricacies of the school house" including how to navigate parent/teacher conferences and become involved in school activities.

A parent outreach coordinator facilitates school and community partnerships and identifies resources in the community that address student needs. For example, the Rotary Club donated dictionaries to the

school and local churches donated school supplies. Moreover, the parent outreach coordinator coordinates food drives, clothing drives and parent activities at the school, such as parent coffees to discuss the PARCC and student academic success.

School Goals

Harrison's school improvement plan (SIP) specifies four goals:

1. To ensure mastery of the content taught at each grade to include reading/language arts, mathematics, and science (kindergarten through grade six).
2. To ensure proficiency with basic math facts in alignment with the expectations of Common Core for each grade-level (kindergarten through grade six).
3. To increase parental involvement and community partnerships in an effort to maximize student achievement.
4. To assess student progress constantly and consistently so that opportunities for interventions are sought out and implemented with fidelity.

Additionally, the SIP outlines strategies to increase student achievement in each of the content areas (math, English/language arts, science, and social studies), improve parent engagement and community involvement, prepare students for college and careers, increase graduation and promotion rates, and improve school climate and culture.

The specified strategies include interventions (such as Response to Intervention), use of small groups and flexible student groupings, access to computer-based interventions (First in Math, Study Island), targeted professional development, use of inquiry based projects and having students develop personal education plans to identify their college and career goals.

School goals are developed through a data-driven process and led by the school leadership team.[30] As one staff member said, "We identify the problem and together we come up with a plan to close those gaps. If we've done assessments and realize that half of the Hispanic [students] are struggling in the area of reading, our responsibility as a team is to build that area up."

However, the principal was clear that multiple factors impact student achievement and that "the goals help, but they aren't necessarily what made the difference…the goals have been established to give a starting point to help students with mastering content." So what has made the difference?

First, to help student's master basic math facts, the principal utilizes the school's elective teachers to provide students with extra opportunities to practice math; these same teachers also provide push-in instruction in the classroom for students needing extra help. For example, the physical education

[30] The school leadership team includes: principal, CSEP coordinator, instructional lead teacher, testing/technology coordinator, reading specialist, math teacher (grade two), reading teacher (grade two), science teacher, parent outreach coordinator, and school counselor.

teacher will drill students in basic math facts as they walk to and from physical education class, or students will do skip counting as they jump rope. He also works in the grade five classroom twice a week for 30 minutes to support math instruction.

Second, to support student's mastery of content across the curriculum, the principal has focused on literacy. One initiative that has been implemented is the "word of the week." Students are assigned a word and given the task of presenting the definition of the word to the entire school during morning announcements. The principal highlights student writing through an initiative called "Writer of the Week." One student from each class is selected each week and an example of their writing is displayed outside of their classroom. Every Monday the principal draws a student's name from a hat and has her talk about her writing with the whole school during the school's morning television announcements.

Third, a reward system has been put in place to motivate students. The principal created a school store, which is stocked by donations from the teachers and other staff members. Each staff member buys five items from the dollar store that students would appreciate, such as Rubik's Cubes. Students receive "Tiger Paws" as rewards for positive behavior and academic accomplishments. For example, when a student answers a math fact correctly, she earns a Tiger Paw that can be used to buy items from the school store.

Fourth, the district adopted student learning objectives (SLOs) to help schools set goals for individual students. Harrison teachers use assessment data to set SLOs. This process allows teachers to "focus on 10-15 kids who are right on the border of being proficient" and push them a little harder to attain proficiency. In other words, data are used not only to set school goals but to monitor progress in meeting them and to drive instructional practices. SLO data are also 50 percent of individual teacher and administrator evaluations.

Finally, the principal expects that "everything is focused on instruction," including the use of resources. The school utilizes several computer programs to support instruction, but the principal emphasizes that they must be not be used haphazardly, "I asked teachers how does that [computer program] impact that child's learning? And if they can't answer me, I say stop using it. Did you provide data to support its use?"

The principal communicates her expectations to the staff through "Week at a Glance" emails. For example, in January these weekly updates included PARCC sample questions for the staff to answer. The principal said: "If teachers don't engage in the questions, how are they going to teach children to engage in the questions? How are you connecting what you're teaching to problems like this? How are you aligning your instruction to mirror this?" The principal discusses these topics during Tuesday's collaborative planning sessions and may use videos to show, for example, a teacher engaging in asking higher order thinking questions in the classroom.

School Schedule and Collaborative Teams

The school day begins at 7:35 a.m. and ends at 1:55 p.m. Students eat breakfast when they arrive at school. The instructional day runs for five hours and 45 minutes, beginning at 8 a.m. and ending at 1:45 p.m. The length of the lunch/recess period is 45 minutes on average.[31] All in all, students receive five hours of instruction daily.

Harrison's kindergarten through grade two students have a daily 135-minute reading block and 75-minute math block. The school's grades three, four, and five have a daily 105-minute reading block and a 90-minute math block. Grade six students have an 80-minute reading block and a 75-minute math block. All students have one 45-minute electives class every day (physical education, music, guidance, computer lab and media). Science and social studies are held on alternating days and range from 40- to-60 minutes depending on the grade-level.

Teachers have 45 minutes during the school day for planning while their students are in specials and an additional 45 minutes after-school (from 2-2:45 p.m.). Tuesday's planning time is set aside each week for grade-level teams to meet with the principal and review and analyze student data as well as plan lessons.

The school's schedule facilitates collaborative planning across grades. For example, first and second grades have identical schedules, as do grades three and four, and grades five and six. However, teachers indicated that they often do not have sufficient time to plan together. After-school staff meetings are allocated for professional development, school leadership team, all staff and school-wide planning, and management team meetings. Moreover, planning time during school can be spent on *either* individual or collaborative planning four days a week.

Curriculum and Instructional Program

In the 2014-15 school year, the district froze Harrison's discretionary budget, which meant that the principal could no longer access those funds. In the words of the principal, "If we need paper, we have to request to purchase it." Her focus on using resources wisely is not simply a matter of what is best for instruction – it is pragmatic. When staff were asked what resources they need to do their job the majority listed materials and supplies necessary to support the instructional program. For example, the principal said they needed more technology, "…[T]ablets, printers, classroom computers… 1:1 that's what most schools are shifting to. Updates could be used with the things that we do have." She also expressed a desire for "supplemental instructional materials for the classroom – can't just do it with the textbooks." Teachers reported that they often spend their own money to enhance their classrooms and existing resources are not distributed evenly across the grade-levels.

[31] Grade six students get 30 minutes for lunch and do not have recess.

Despite these concerns, the school appears to have access to several commercial programs to supplement and enhance the reading and math curriculum.

Curriculum: Reading

Harrison's teachers rely on the curriculum framework created by the PGCPS central office as a guide, but it's not the sole component of instruction. Several commercial programs are used to supplement the district curriculum including Reading Street Common Core (Pearson) in grade two, Reading Wonders (McGraw Hill) in kindergarten, Writing Fundamentals (School wide Inc.) in kindergarten through grade six, and iReady (Curriculum Associates) in select kindergarten through grade six classrooms.

Reading Street is aligned to the State's College and Career-Ready standards and provides teachers with lesson plans to teach concepts such as phonics and vocabulary, and build student's content knowledge. The program has an online component with videos that help students practice grammar and also includes level readers for students to practice reading.

Reading Wonders is a new program used in kindergarten that comes with multiple components, including leveled readers and unit assessments. The program is aligned to the State's standards and focuses on helping students learn how to access complex text, find evidence, and develop the skills necessary to become a proficient reader (such as phonics and vocabulary).

Writing Fundamentals focuses on teaching students about different styles of writing – in other words, the different forms and purposes that writing can take. For example, kindergartners are taught about "how to" writing, which the program's website[32] describes as text "written to teach readers how to do some activity or understand some process about which the writer is an expert."

iReady is an online program that is also aligned to the State's standards. The program provides teachers with specific assignments and tasks on each of the standards for students to complete. iReady has an assessment component that allows teachers to monitor student progress and mastery of skills in reading comprehension, phonics, and vocabulary.

Curriculum: Math

The math curriculum used at Harrison is based on frameworks developed by PGCPS and supplemented with several commercial programs.

My Math (McGraw Hill), used in all grades, is a program aligned with the State's standards and designed to build student's conceptual understanding, application and procedural skills, and fluency. Teachers are provided with lessons designed around an activity introducing the concept, a direct instruction

[32] www.schoolwide.com/writing

component, practice and application tasks, and a homework assignment. The program materials for teachers include suggestions for differentiated instruction, including for English language learners.

iReady is also used for math. Similar to the reading program, the math component provides teachers with specific assignments and tasks on each of the standards for students to complete. iReady has an assessment component that allows teachers to monitor student progress and mastery of skills in areas such as numbers and operations.

Elective teachers help ensure students master basic math facts by integrating math activities into their classes. For example, the physical education teacher will drill students in basic math facts as they walk to and from PE class or students will do skip counting as they jump rope. He also works in the grade five classroom twice a week for 30 minutes to support math instruction.

Curriculum: Science

PGCPS does not develop its own science curriculum. Harrison uses Discovery Education Science Techbooks. These are digital textbooks that are aligned to the Next Generation Science Standards (NGSS), which PGCPS is beginning to implement. Teachers are also encouraged to embed science content within English/language arts instruction.

Advanced Instruction

Students identified as gifted and talented participate in a weekly pull-out program that provides differentiated instruction targeted to meet their "accelerated academic level."

Assessments

Harrison's teachers use multiple assessments to monitor student progress and learning. First, several diagnostic assessments are given throughout the year. The Diagnostic Reading Assessment (DRA) is given to all students in grades kindergarten through two and to students at risk of academic failure (i.e. reading below grade-level) in grades three through six. The DRA measures comprehension and fluency skills and is administered three times per year. The Scholastic Reading Index (SRI) is a paper/pencil test (although the school piloted an online version of the SRI in 2014-15) administered in grades two through six three times per year to assess students' reading level.

The iReady program comes with built in diagnostic assessments to track student progress towards achieving end of year targets.

Formative assessments used in grades two through six include the Scholastic Math Index (SMI), which is a computer-based assessment that provides information on students' math understanding and achievement. The school administered this assessment for the first time during the 2014-15 school year; however, the district discontinued the use of the SMI midway through the year.

PGCPS mandates that the school administer quarterly benchmark assessments in the areas of reading and math. These assessments are developed by the district and used to determine whether a student

has mastered specified concepts at the end of each quarter. For example, grade one students are expected to be able to use additions within 20 to solve word problems, add and subtract within 20, and show fluency involving facts to 10 by the end of the first quarter of the school year.

Students also take common grade-level unit assessments in reading and math. The math department develops its own unit assessments via EduSoft, an assessment management system that allows teachers to collect and analyze student performance data. The reading unit assessments are pulled directly from the Reading Wonders program.

Finally, teachers observe students individually and in small groups to gauge student understanding of concepts being taught. They use exit tickets to identify students struggling with a specific concept. One teacher commented that these exit tickets often consist of asking students to complete a simple program and serve as a "mini-quiz or assessment." The results are used to "pull the kids that struggled" and re-teach them.

Teachers use data from all of these assessments to inform instruction in three ways. The first is to group students by ability level. As one teacher noted, "We group [students based on DRA score] looking at those that haven't mastered all the letters [and] work in small groups."

The second is to identify students in need of intervention or a referral to an RTI intervention or to be evaluated for special education services, "[I] look for a child's strengths and weaknesses and see who [I] need to pull. Do they need a referral? Do they need to be tested for something additional?"

Finally, these data are used to determine concepts that require re-teaching. Data are also used to push the advanced students to ensure they are receiving rigorous instruction as well. As another teacher shared, "[There are] different ways of pulling up the data to see where [students] are lacking and you get a sense of the percentage of students that don't get a particular topic and you realize you have to do more on that."

Interventions and Supports

Harrison has implemented many different interventions to support students who are at risk of academic failure. Many of these are commercially available interventions. Interventions are largely concentrated on the school's tested grades or subgroups including LEP or special education students. The school has one extended day program targeted at LEP students.

The school relies on several commercial interventions programs such as iReady, First in Math, Wild Cats, iStation, Study Island and FASST Math:

- iReady is used in reading and math in select kindergarten through grade six classrooms. This computer program provides differentiated instruction for students and a variety of diagnostic assessments to monitor student progress;

- iStation is a computer program for grades two through five that provides supplemental math instruction. Importantly, iStation is a resource used to support the school's RTI program;
- First in Math (grades three through six) is a computer program that provides students with opportunities to practice basic math facts and collect points and stickers. One teacher noted that the points and stickers serve as incentives to keep students going through the program;
- Wild Cats is a reading intervention that is book-based. The books have themes and feature different text structures (informational, narrative, story, poem) and activities;
- Study Island (grades three through six) is another computer-based program that is used to help the development of students' reading comprehension, fluency, and accuracy; and
- FASST Math (Scholastic) is a program designed to build student's math fluency. The program is adaptive and so it provides support aligned to meet students' individual needs and levels of performance

A few staff members noted that interventions generally target students in tested grades. For example, kindergarten has very few formal interventions. One staff member said, "The teachers are the interventions" – although the school's parent coordinator (who is a former teacher) came in at the beginning of the year and ran an intervention with students who were having difficulty with letters. According to another teacher, "Once testing hits, everyone pushes into the tested grades."

There is an intervention specialist who comes twice a week and provides push-in and pull-out services for students. The position is not part of the school's staffing; rather it is provided by the district. The intervention specialist works with teachers to identify students who would benefit from small group instruction. These determinations are made based on student data. For example, when we visited, the intervention specialist was working with a group of grade two students on improving their reading skills.

The LEP program provides both push-in and pull-out instruction. LEP students are pulled out during their reading periods and work on the same content but in a small group setting. This arrangement means that classroom teachers and LEP teachers must engage in collaborative planning to ensure students learn similar content. LEP students also have access to an after-school LEP program that is paid for by the district. The district also supports an LEP after-school tutoring program that enrolls 22 students and meets two times a week from late September to May.

The school has two special education programs. The Comprehensive Special Education Program (CSEP) is a self-contained model of small class sizes (10-12 students) that has elements of inclusion. For example, students in the CSEP program at Harrison attend elective classes with students in the general education program. The Community Referenced Instruction (CRI) program is for students with severe cognitive disabilities and focuses on developing functional life skills. These programs have two major advantages: class sizes are small and there is a generous student-to-teacher ratio. These classrooms enroll about 12 students and have both a teacher and paraprofessional. Additionally, some of the students have a dedicated aide to provide them with additional support.

Harrison does not offer summer school on a regular basis. To offer a summer school program, the principal must put in a request to the district to be a summer school site. If the district agrees, letters are sent to all students at risk of academic failure inviting them to receive intervention over the summer. During the summer of 2014, the school offered a summer school that included a rising grade two program targeted at grade one students from different schools.

The school has one extended day program that is targeted at LEP students. Additionally, there is a program for parents of kindergarten through grade two called Great Start that consists of informational sessions on how parents can work with their children and support their learning at home. Another program offered for parents is Side by Side, which includes parent workshops and family dinners.

Finally, the school uses Response to Intervention (RTI), which is a tiered intervention system. The model uses research-based interventions designed to help students identified as being at risk of developing learning or behavioral problems. Tier I interventions take place in the general education classroom and include differentiated instruction and flexible grouping. Tier II interventions target students who do not show progress under Tier I interventions alone and include small group instruction multiple times per week with frequent progress monitoring. Tier III interventions include small group and/or individualized instruction four or five times per week that may take the form of a double block of instruction in a specific content area.

Professional Development

Professional development is offered to teachers once a month after-school (2-3:45 p.m.). Professional development is aligned with strategies or content that are the "focus of that month," for example, higher order thinking questions skills. The principal usually leads the sessions, but occasionally teachers or someone from outside of the school will provide professional development. Additionally, professional development is sometimes differentiated based on the needs of the teachers and the content of the training. Teachers also receive one student-free day for professional development per quarter offered by the district.

The instructional lead teacher (ILT) provides teachers with coaching and professional development around specific content. She is available to answer teachers' questions about the curriculum and classroom instruction. The ILT also creates resources such as documents and videos to help teachers learn new pedagogical methods.

School Culture and Leadership

One common theme surfaced when discussing school culture – a lack of parent involvement. The principal shared that "Parents are not very involved…I remember coming to a PTA meeting where there were more teachers than parents…I don't think parents don't care…. but the way they are able to show their support is different…[they] help with homework but never come to school functions."

School staff had mixed feelings about what it was like to work at Harrison. One teacher said, "It's a nice school. Very friendly teachers. There's a sense we're all in the same boat. We all feel like we have each

other and we're all expected to do the same. We're all just trying to survive." While another commented, "…[I]t's not one of my favorite places. [There's] just not enough…there's not anything fun to do here…the staff is so small and burned out, anything extra seems like it's work." The same teacher bemoaned the lack of after-school activities for students. However, students are recognized for making the honor roll, for perfect attendance or as the student of the month.

The principal has a very hands-on leadership style characterized by frequent and consistent communication with staff members about her expectations and strategies for aligning instructional practices with needed areas of focus (such as the PARCC) through her "Week at a Glance" emails. She works with her school leadership team to develop content to present to teachers during staff meetings. For example, the leadership team created plans for instructing teachers on the "Data Wise Process," which included a review of all the assessments the school uses and why they use them.

The principal emphasizes factors that she and the staff can control: "We can't do anything about lack of resources…we consistently work on parent engagement. So [we] don't spend time talking about what we can't control." What they can control is instruction, "[I]…look at the actual student data and present that to the staff…these students are suffering in these areas. [I look at] whole data to see what could possibly be the problem with instruction at the school. Everything is focused on instruction…"

Finally, she ensures that the school's resources are used strategically and maximized for the benefit of students. The use of elective teachers to help support classroom instruction is one example of how the principal stretches staffing resources. Since the school cannot afford to have paraprofessionals in every classroom, elective teachers (physical education and music) help provide small group instruction and even integrate math content into their classes.

Summary

Between 2007 and 2012, Harrison saw consistent gains in student achievement on the MSA. Interviews with staff members and the principal point to several factors that have contributed to these increases:

1. Data-driven decision making: The principal and teachers use data from a myriad of student assessments to undertake focused instructional practices. Teachers use data from assessments to inform instruction in three primary ways: to group students, to identify students in need of intervention or referral, and to determine concepts that require re-teaching.
2. Multiple interventions: Multiple interventions have been implemented at Harrison to support students who are struggling academically. These include commercial programs such as iReady, iStation, Fasst Math, First in Math and Study Island. English language learners receive tutoring after-school. Harrison has two programs for special education students – the Comprehensive Special Education Program (CSEP) is a self-contained model of small classrooms, and the Community Referenced Instruction (CRI) program is for students with severe cognitive disabilities and focused on developing functional life skills. RTI is also used to provide research-

based and targeted interventions, such as small group instruction, to support students with learning or behavioral challenges.

3. Use of elective teachers and specialists to support classroom instruction: The principal leverages the school's elective teachers (physical education, music) to supplement classroom instruction. They have "specific responsibilities around the school-wide goals" such as teaching basic math facts. These teachers "can't monitor work [but can] drill students and give them [Tiger] paws" that can be used in the school store. Moreover, elective teachers provide push-in support in the classroom via twice weekly 30-minute small group sessions focused on boosting student performance in math and also provide support outside of the classroom.
4. School leadership: The principal has been purposeful in communicating her expectations to staff and providing support and guidance on their deliberate and intentional instructional practices that makes a positive impact as evidenced by student data. She sends a weekly "Week at a Glance" email that includes strategies for aligning instructional practices with particular areas of focus (such as the PARCC). The principal uses resources strategically to benefit students – such as pulling in elective teachers to supplement classroom instruction.

Alignment with the Evidence-Based Model

Many of the strategies implemented by James H. Harrison Elementary School to boost student performance are aligned with the EB model. First, the school's instructional leadership team and teachers engage in data-based decision making. In previous years, scores on the MSA were used to set goals and identify strategies for increasing student achievement. Other data sources, such as diagnostic and formative class assessments, are used to identify concepts that require re-teaching. Student placement in intervention is also determined by assessment data.

The school has an instructional lead teacher who provides coaching, support, and answers teachers' questions about the curriculum or anything related to classroom instruction. The principal also supports instructional improvement by sharing strategies and ideas through her "Week at a Glance" emails and weekly grade-level team meetings. She pushes teachers to consider whether they are implementing "focused instructional practices every day" and to align the teachers' instruction with the content area focus (English/language arts, math) and standards. These practices, together with the frequent use of student data to inform instruction, ensure that class time is used efficiently.

Multiple interventions have been implemented to support students at risk of academic failure. Harrison uses the RTI model, a three-tiered system of research-based interventions and supports. The interventions become increasingly intensive as a student moves through the tiers. For example, Tier I interventions are delivered in the classroom and include strategies such as flexible grouping and differentiated instruction. Tier III interventions provide students with intensive supports such as individual or small group instruction. Students are also provided additional practice and individualized instruction via the use of several commercial programs such as iReady, iStation, Fasst Math and Study Island.

Harrison is resourced beyond what the EB model would provide for a school its size. For example, the school has many more pupil support staff – including a speech pathologist and crisis intervention teacher – than would be expected. However, the large number of student support staff may be due to the school's CSEP and CRI programs. In addition, the school administers multiple, overlapping assessments and does not have a core reading program. Instead of one reading program, the school uses commercial programs that differ at each grade-levels. Some of these resources could be reallocated to address other perceived needs in the school and reduce the work burden felt by teachers.

Additionally, there are elements of the EB model that were found lacking at Harrison. The principal commented that she "Need[ed] money for professional development…to call in experts to teach the teachers how to teach that math" and that one of the challenges she faces is "building teacher capacity to get the job done." In other words, she is rarely able to leverage external expertise to help improve instructional practices within the school. Additionally, the school's class sizes are larger than the EB model recommends. This may be due to the fact that Harrison is a small school and enrollment is not high enough to warrant having multiple classrooms for each grade-level.

Taken together, Harrison has implemented several strategies to boost student achievement but has experienced challenges in allocating resources in ways that the principal and staff believe would be beneficial for instruction and student learning.

Chapter VII: North Frederick Elementary School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Executive Summary

North Frederick Elementary School is an example of the fourth category of schools – those significantly reducing the achievement gap between low-income students and their more affluent peers.

North Frederick Elementary School serves an economically and racially diverse population of learners. It has received targeted Title I funds since 2009 and became a school-wide Title I school in 2014-15. It has also been designated as one of the gifted and talented magnet schools for Frederick County Public Schools. Between the 2007 and 2012 school years, the school experienced a steady increase in student performance on the Maryland School Assessment (MSA) and a significant reduction in the performance gap between students eligible for the free and reduce-priced meals program (FRPM) and non-FRPM students. The average percentage of students scoring proficient or advanced grew from 77 percent in 2007 to 92 percent in 2012. In 2007, the difference between the percentage of FRPM and non-FRPM grade three students scoring proficient or advanced in reading was 29.7 percentage points, but by 2012, the difference was reduced to 6.3 percentage points. In grade five math, the difference in performance decreased from 47.4 percentage points in 2007 to 3.1 percentage points in 2012. Gaps between the overall student population and the subgroups of limited English proficient (LEP) and special education students were also reduced during these years.

Many factors have contributed to this success in improving student performance. The school staff and administration maintain high standards for themselves and for the students, and resources are deliberately used to help students, teachers, and the school as a whole meet their goals. For teachers, these resources include a well-designed, comprehensive curriculum that provides abundant instructional material choices. Collaborative planning time enhances planning and instruction. Teachers receive purposeful professional development on curriculum, data analysis, and pedagogy. Much of this professional development (PD) is delivered during weekly in-school sessions. Instructional coaches are available to support teachers as well.

A variety of supports are available to meet students' academic and behavioral needs. The school uses funding from several 11-month positions to run an Extended Learning Opportunity program in which targeted students meet in small, club-like groups after-school for extra help in reading and math. Along with classroom teachers, a staff of reading and math intervention teachers, special education teachers, LEP teachers, speech teachers, and instructional aides provides extra help, delivers specialized intervention, and makes sure each student receives the support he or she needs to succeed.

As a Positive Behavior Interventions and Supports (PBIS) school, North Frederick uses a variety of incentive programs to motivate students to achieve high behavior and attendance standards. School-wide expectations for behavior are established and reviewed regularly. A student support teacher and community liaison help keep parents informed and involved, and work with students on behavior, attendance, and emotional support. The school also has a one-to-one mentoring program that pairs targeted students with a teacher mentor for regular check-ins and meetings.

North Frederick's teachers use data to inform their instruction. Data are collected through classroom, district, and state assessments, and teachers meet regularly to analyze data. At quarterly progress meetings, they develop specific teaching goals based on the data and report back on these goals at the next meeting. Teachers also use a variety of key instructional strategies, shared across grade-levels, to strengthen instruction. This school-wide emphasis on key pedagogies and best practices builds continuity across classes and grades.

North Frederick receives strong leadership from the principal, and teachers, specialists, and aides work as a team to meet the needs of students. This school is characterized by collaborative problem solving, professionalism, individualized instruction and intervention, and data-driven decision making. The result is a positive school culture where students are supported and successful.

Introduction

North Frederick Elementary School is located within the city limits of Frederick, Maryland and is part of the Frederick County Public Schools system (FCPS). North Frederick is a neighborhood school with most of the students living nearby. It is also one of three gifted and talented magnet elementary schools in the district, so some students are bused from other areas of the district. The school is characterized by both economic and racial diversity. This is a Positive Behavior Intervention School (PBIS) and has been recognized as a Gold Banner PBIS school for the past three years.

In fall 2014, the newly constructed North Frederick Elementary School building opened its doors. The new school is situated on the same property as the old building, which was built in the 1950s and has since been razed. The modern, new school features spacious classrooms and up-to-date technology in every room. Perhaps because of the attraction of the new building, new students have been enrolling each week. Student enrollment reached 590 in January 2015. Over the past decade, enrollment has ranged from 568 to 655 students.

The average class size at North Frederick is approximately 22 students. Average class sizes by grade-level are presented in Table 1. There are four to five sections of each grade in grades kindergarten through five. In addition, there are two half-day prekindergarten classes. Magnet classes are capped at 26 students per district policy. Class sizes have increased across the district, in large part due to reduced staffing, and the principal at North Frederick noted this school is experiencing the same trend, but has managed to keep classes fairly small through the use of federal Title 1 funding for staffing positions. The district also has provided a differentiated staffing model for schools with higher levels of poverty.

Table 1
North Frederick Elementary School Class Sizes
2014-15 school year

Grade	Class Size
Prekindergarten (2 classes)	20.5
Kindergarten (4 classes)	20
First (4 classes)	22
Second (5 classes)	18
Third (5 classes)	18
Fourth (4 classes)	24
Fifth (5 classes)	21

North Frederick Elementary has received targeted Title I funds since 2009, and in 2014-15 it became a school-wide Title I school. The percentage of FRPM students has increased over the past decade from 27.4 percent in 2004 to 47.0 percent in 2014. Many middle class and affluent students also come from nearby neighborhoods and from across the district if they are involved in the magnet program. The result is great economic diversity among the student body. There is also racial diversity. The school is 23.4 percent African American, 23.6 percent Hispanic, and 41 percent white. Approximately 14 percent of students are limited English proficient (LEP), and 6.1 percent of students receive special education services. Table 2 shows the school's student characteristics. There was an 18.2 percent mobility rate in 2013-14, which is higher than the 12.8 percent average for elementary schools in the district.

Table 2
North Frederick Elementary School Student Characteristics 2014-15 school year*

Student Characteristics	Percentage of Student Population
Race/ethnicity	
American Indian/Alaska Native	0.3
Asian	7.8
Black/African American	23.4
Hispanic/Latino	23.6
Native Hawaiian/Pacific Islander	0.2
Two or more races	3.7
White	41
Students eligible for free or reduced-price meals (FRPM)	47.0
Limited English Proficient (LEP) Students	13.9
Special education students	6.1

*Based on January 2015 enrollment.

North Frederick Elementary was selected for this case study because of the progress it has made in reducing the achievement gap between students in poverty and the rest of the student body. This study is based on data from interviews conducted in February 2015 with the principal, assistant principal, teachers, and specialists in the school. Information was also collected from the school website, the School Improvement Plan, and scheduling and staffing documents provided by the principal.

The case has 11 sections: 1) school performance, 2) school staffing, 3) school goals, 4) collaborative planning time, 5) curriculum and instructional program, 6) assessments, 7) extra help for students at risk of academic failure, 8) professional development, 9) school culture and leadership, 10) the summary, and 11) alignment with the EB funding model.

School Performance

North Frederick experienced a steady increase in student performance on the MSA between 2007 and 2012. The average percentage of students scoring proficient or advanced grew from 77 percent in 2007 to 92 percent in 2012. In addition to the increase in the performance of all students, there was also a significant reduction in the performance gap between FRPM and non-FRPM students. For example, in 2007, the difference between the percentage of FRPM and non-FRPM grade three students scoring proficient or advanced in reading was 29.7 percentage points, but in 2012, the difference fell to 6.3. In grade five math, the difference in performance decreased from 47.4 percentage points in 2007 to 3.1 percentage points in 2012. Gaps between the overall student population and the subgroups of LEP and special education students were also reduced during these years.

Table 3 shows the composite data used to select North Frederick Elementary for this case study. The percentage of students who are proficient or advanced across all subjects (reading and math in grades three through five, and science in grade five) was averaged to produce a number – percent proficient or advanced – for each year from 2007 to 2012. For 2013 and 2014, only "All Students" scores were available. During this latter two-year time period, the state's curriculum standards changed, but the MSA tests did not. To be identified as a school that reduced the performance gap between low-income and more affluent students, the criteria called for a reduction in the gap of FRPM to all students by at least two standard deviations (approximately 14 percentage points) over the six-year period.

Table 3
North Frederick Elementary School Performance,
Maryland School Assessment (MSA), 2007-2014

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2010**	**MSA 2009**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	77	80	87	87	88	92	90	84
Free and reduce-priced (FRPM) Students	53	59	74	75	78	87	NA	NA
Limited English Proficient (LEP) Students	45	59	82	89	96	89	NA	NA
Special Education Students	33	47	63	52	57	77	NA	NA

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

School Staffing

The administrative staff at North Frederick includes the principal, an assistant principal, a school support specialist, and school counselor. The school support person is a behavior specialist, and she is assisted by an aide who is also a trained guidance counselor. Together, these two help teachers develop Response to Intervention (RTI) Tier 1 behavior interventions, handle discipline calls and proactive breaks, check in with students, and run weekly behavioral update meetings. A community liaison works to bridge the gap between home and school, monitors attendance, and calls home when a student is absent. In the past, the school has had two assistant principals, but the school lost one assistant principal position beginning with the 2014-15 school year. Table 4 shows the school's staff by full-time equivalent (FTE) position.

North Frederick hosts a prekindergarten program with two half-day sessions that is staffed by a certified teacher and an instructional aide. There are 27 core kindergarten through grade five teachers who provide content area instruction in math, reading, writing, science, and social studies. Four of these teachers serve students in the gifted and talented magnet program. At the time of the site visit, the magnet teachers were in the following grades: three (one teacher), four (one teacher), and five (two teachers). The school has five full-time and three part-time (0.6 each) elective teachers for art, music, instrumental music, and physical education. There is also a full-time media teacher/librarian, who is assisted by a full-time aide. The full-time aide in the media center also supports the school in other ways, including working with small groups in kindergarten during math instruction.

Table 4
Staffing in North Frederick Elementary School

Category	FTE
Administration	
Principal	1.0
Assistant Principal	1.0
School Support	1.0
Clerical	2.0
Prekindergarten Program	
Licensed Teachers	1.0
Instructional Aides	1.0
Main Program	
Core Teachers (Includes 4 Gifted/Talented Magnet Teachers)	27
Elective Teachers (Art 1.6; Instrumental Music 2; Music 1.6; Physical Education 1.6)	6.8
Special Education Teachers	3.0
Reading and Math Intervention Teachers (Targeted Intervention)	3.0
Speech Teachers	0.8
LEP Teachers	2.0
Librarian	1.0
School Support Teacher	1.0
Instructional Coaches (One Reading Coach, One Math Coach, One Technology/Assessment Coach)	3.0
Aides	
Instructional Assistants – Special Education	8.0
Instructional Assistant – Media	1.0
Behavior Support/Instructional Assistant	1.0
Instructional Assistant – General	1.0
Technology/User Support	1.0
Student Support	1.0
Pupil Support	
Licensed	
Guidance Counselor	1.0
Nurse	0.5
Non-licensed	
Community Liaison	1.0
Health Tech	1.0
Custodial Staff	4.5
Lunchroom Staff	4.0

There are a number of full-time and part-time specialist teachers who provide inclusion and pull-out support for students. This specialist staff includes three special education teachers, two LEP intervention teachers, and two part-time speech intervention teachers. Three full-time teachers provide reading and/or math support. Additionally, the specialist staff includes three instructional coaches who lead professional development and instructional support efforts in reading, math, and technology. The instructional coaches are content area experts who assist with diagnosing students' needs, planning instruction, and identifying resources. The technology coach also provides coaching for formative assessment, using technology for assessment, and data analysis.

The support staff members are important parts of the school community, providing instructional, logistical, and behavior support. Eight special education instructional aides and one LEP aide provide individual and small group support in inclusive settings. Two general instructional aides provide additional support where needed, including providing coverage for meetings, clerical support, and behavior intervention. Finally, a technology aide provides user support and technology problem-solving help.

Some support staff are shared with other schools in the district. The school psychologist visits the school weekly to attend individualized education program (IEP) meetings, meet with students, and provide support as needed. A special education specialist visits one-to-two times per month to meet with the special education team, and a district director meets with the principal biweekly to provide support and professional development to the administration.

North Frederick Elementary is a Professional Development School (PDS) for Hood College. The school regularly hosts interns for field experiences and full-time student teaching. When possible, interns attend regular school-based meetings with specialists and grade-level teams so they can participate more fully in supporting students. The school values the extra help interns provide in the classroom and one of the instructional coaches serves as the coordinator of intern placements. She meets regularly with interns and communicates with Hood College personnel.

Scheduling

The school day begins at 8:20 a.m. and ends at 2:45 p.m. with student dismissal. Breakfast is available in the classrooms for all students. There are a variety of before- and after-school programs, but the main school day is comprised of 330 minutes of instructional time, including transitions, and 55 minutes for lunch and recess. Core teachers are responsible for instruction for 285 (86.4 percent) of these minutes, and elective teachers for the other 45 (13.6 percent) minutes. Core teachers have common grade-level planning time while students attend their daily elective. A standard formula for the number of elective teachers is to have the number equal to 20 percent of the number of core teachers, which would equal 5.4 positions for this school (0.2 x 27). The total at North Frederick is above this level at 6.8 FTE.

School Goals

North Frederick Elementary has articulated goals for student achievement, school culture, and technology use. All goals are based on data analysis and articulated in the annual school improvement plan. There is a school-wide common focus on the annual goals and each teacher's student learning objective (SLO) reflects the school-wide focus for the year. The principal noted that the staff had been setting goals, collecting data, and assessing progress consistently even before the SLO process was required.

The school-wide English/language arts goal for 2014-15 focuses on using key ideas and details to increase text comprehension. According to the school's Continuous Improvement Plan, "Teachers will on a daily basis, incorporate higher level key idea/detail questions, which include theme and author's purpose. Students will use a school-wide consistent coding method to help identify the key idea/detail when reading a story in print or digitally." The staff has developed and implemented the coding method that is used across grades. The goal is for student performance to increase from 86 percent (fall 2014) to 95 percent (spring 2015) of students performing at or above grade-level on the Global Scholar Performance Series, a standardized assessment used by FCPS. Furthermore, the school aims to improve scores for student subgroups from 75 percent to 90 percent for African American students and from 73 percent to 90 percent for FRPM students.

In math, the school's goal is to improve students' ability to solve two-step math problems. A research-based, four-step Problem Solving Process (Understand, Plan, Implement Plan, Reflect) was developed, and all teachers were trained on using it. The Problem Solving Process program guides students through the problem-solving process and provides a common framework across grades. The goal is to increase the number of students performing at grade-level on the Global Scholar Performance Series Assessment from 91 percent to 95 percent for all students, from 75 percent to 86 percent for African American students, and from 73 percent to 83 percent for FRPM students.

To enhance school culture, North Frederick plans to continue the PBIS work that has shown positive results. In addition, the school has set goals to reach the "excellent" (96 percent) attendance rate; increase attendance at family involvement events, especially of subgroups; and to increase the positive perception of its work to reduce bullying. With a 95.6 percent attendance rate in 2013-14, the school is very close to achieving its attendance goal. The school has achieved an average attendance rate of 95 percent or above since 2004.

The newly built school is technology rich. Based on data from a technology inventory completed by the staff, the administration plans to include the following topics in professional development sessions: using interactive activities during instruction, using technology to administer formative assessments and to analyze assessments to drive instruction, using technology for collaboration, and using technology to express learning.

Collaborative Planning

The administration's commitment to regular collaboration includes the deliberate scheduling of time for common planning time, providing instructional coaches to plan with teachers, and linking professional development to instruction and collaboration. These are all critical elements in the level of instructional effectiveness North Frederick teachers.

North Frederick uses a team model to promote collaboration among teachers. Teachers have common grade-level planning time every day while students attend electives. Several years ago, the principal noted the need for more collaboration and that teams did not always plan together, even when given common planning time. She trained team leaders on how to lead collaborative planning sessions and required teams to plan together every Friday. She said this mandated collaborative planning helped teachers develop the habit of team planning, and now teams and grade-level peers plan together regularly – on Fridays and throughout the week.

Intervention teachers and special education teachers often join team planning sessions or plan with individual teachers to ensure student needs are being met. When these specialists cannot attend team planning, they communicate via email with the teachers to discuss plans and supports.

Teachers receive additional support for planning instruction, exploring resources, and implementing strategies during weekly professional development sessions and quarterly progress meeting, both of which are described below. Instructional coaches collaborate with individuals and teams to provide additional support.

Curriculum and Instructional Program

At North Frederick, several key elements of the curriculum and instruction program contribute to student performance. These elements include a rich, well-organized, and easily accessible central curriculum; common pedagogies across grades; data driven instruction; organization of instructional time; and individualized instruction.

Central Curriculum

Teachers follow the Frederick County Public Schools' curriculum, which has been revised to align with Maryland's Common Core based College and Career-Ready Standards (MCCRS). The fully online Curriculum Now system houses standards, a curriculum map, assessment schedules, lesson suggestions, and links to suggested resources that correlate with each standard. Teachers noted that the curriculum is well organized, easy to access from school or home, and offers a wide range of resources. One teacher said the integrated, online curriculum was a "great achievement" of the district. Teachers have the freedom to select the texts and resources that are appropriate for their students and to adapt materials to meet the needs of their classes. For example, the curriculum might indicate that a lesson includes a "short literary text" or "long literary text," and then provides a list of options from which teachers might choose.

There is no textbook series for reading, math, or science. Instead, teachers rely on the online curriculum to guide their long-term and daily planning. They select instructional materials from the resources included in the curriculum, and they also create or find their own materials so that instruction is tailored to students' needs and interests. A well-stocked book room provides many text choices and resources. The central curriculum provides continuity across grade-levels so teachers know how their goals and materials relate to the goals and materials for other grades.

Common Pedagogies and Strategies for Success

The consistent use of key pedagogical strategies provides continuity and reinforcement of ideas across classrooms and grades. Teachers said that this consistency helps students understand expectations, learn concepts, and transition smoothly to new classes.

While teachers have a great deal of flexibility to modify curriculum and tailor instruction, they also receive professional development on key strategies that are implemented school-wide. For example, the school's four-step Problem Solving Process is a part of math instruction in every grade. Bookmarks and posters remind students of the steps, and the process is modeled by every teacher and used by every student. Similar tools have been developed to help students in writing and reading.

A list of key "Strategies for Success" created and shared by the staff highlights pedagogies that encourage continuity and rigor. For example, teachers across grade-levels use the "hot seat" method and running records to conduct daily, informal assessments one-on-one with students during small group reading instruction. Teachers in the primary grades focus on assessing phonemic awareness and explicit teaching of phonics, vocabulary, comprehension, and fluency into their small group lesson plans. Teachers in the intermediate grades continue with small group work and "hot seat" assessments, shifting the focus to comprehension, reading strategies, and text-dependent questions. Other common instructional strategies include the following:[33]

Math

- Purposeful instruction in math vocabulary;
- common formative assessments completed in a journal that follows students through each grade-level;
- verbal and written math reasoning activities;
- progression from concrete to visual to abstract manipulative/representations for math concepts;
- daily opportunities for mental math; and

[33] These strategies are articulated on a "Strategies for Success" handout.

- four-step Problem Solving Process.

Reading

- Daily read aloud/think aloud with complex text (whole class);
- text-dependent questions;
- extend comprehension beyond the literal;
- focus on vocabulary, fluency, and phonics in primary grades (must be explicitly included in lesson plan);
- explicit instruction in reading strategies;
- daily independent reading time with reader response journals;
- classroom libraries with appropriate text choices; and
- annotating text using FCPS poster/techniques.

Writing

- Daily writing instruction beginning the first week of school;
- daily independent writing;
- mini-lessons that model the central concept of each lesson and unit;
- use of Quick-Words Books, leveled handbooks of high-frequency words and phrases; and
- Writing about reading posters and strategies.

Data Driven Instruction

Instruction at North Frederick is strategically driven by data. Teachers use data from a variety of assessments to plan instruction, create groupings, and differentiate instruction. Teachers prioritize individual instruction and seek to use "good teaching strategies for every student." The principal noted that the district provides easy access to data through a system called Ed Performance. Teachers are trained on how to access, organize, and interpret data within this system.

Teachers regularly analyze data throughout the school year, but special emphasis is placed on data analysis during quarterly progress meetings when the special education teachers, intervention teachers, and principal meet with grade-level teams. They focus on data disaggregated by subgroups and individual students. Based on this data, each teacher identifies specific standards that students are struggling with and develops a plan to address those needs. Teachers leave these progress meetings with deep understanding of their students' performance, a plan to support further learning, and specific goals to work toward for the next meeting. Between meetings the specialists and instructional coaches support teachers in implementing the plans and achieving these goals.

Organization of Instructional Time

Each grade's math block is between 75- and 90- minutes per day, with higher grades having slightly longer blocks than lower grades. The math block includes whole group instruction with students then dividing into two groups (or three in kindergarten) for further instruction and practice. All students

come back together for closure at the end of the lesson. Teachers noted that this closure time was important for reviewing key concepts and conducting informal assessments. At the end of each math block, before the closure, there is a 10-minute block designated for enrichment and intervention. Teachers described this time as "very valuable," because it gives them an opportunity to reinforce and expand instruction. Sometimes they have students do a project to apply the math concepts they have studied, and other times they might use it for re-teaching or to provide addition practice.

The time allotted for daily instruction in reading and writing varies from grade to grade. For example, the 110-minute reading block in kindergarten includes 10 minutes of whole-class instruction, 75 minutes of small group instruction, and 15 minutes of phonics/vocabulary. Grade five students have the longest reading block – their 85 minutes includes 20 minutes of whole-class and 65 minutes of small-group instruction. Grades kindergarten through two include phonics, fluency, and vocabulary instruction in the reading schedule.

The reading block is divided into whole-class and small group time, with time for individual reading. Students of similar ability levels are placed in of three homogeneous groups. Whole-class instruction is based on the grade-level curriculum and standards; this content is then differentiated to meet the needs of each small group. The use of flexible small groups in reading allows teachers and specialists to more closely monitor student learning, differentiate instruction, and work with individual students to provide enrichment and additional support.

All students have a daily writing block that ranges from 40- to- 60 minutes. This writing focus helps prepare students for the writing demands of MCCRS and PARCC assessments.

Individualized Instruction

In both reading and math, teachers use grouping strategies and differentiation to individualize instruction. They work individually and with their team to select and modify activities strategically to support the learning of each student. The district's curriculum offers a variety of resource suggestions, including embedded links to materials, which facilitate differentiation. This easy access to a rich variety of vetted instructional materials that are aligned with the curriculum is key to teachers being able to meet the needs of all of their students. Intervention teachers, special education teachers, and instructional assistants lead small groups in reading and math, provide individual support, and co-teach. Students receive more individualized attention because there are additional teachers and aides in the classroom.

Reading Intervention

The school's instructional coach for reading works with teachers to identify and support struggling readers. The reading intervention teachers use a wide variety of research-based resources and programs to meet individual needs, both in the classroom and in pull-out sessions for small groups and individuals. A variety of intervention resources are used to address needs at every grade-level. For example, young

and beginning readers who need extra help might use SIPS (Systematic Instruction in Phonics), a structured program focused on phonemic awareness and site words, and Sound Partners, a one-on-one curriculum that emphasizes decoding, sounds, and phonemic awareness. Other reading interventions include Soar to Success, a comprehension program for students in grades three to five, Read Naturally, a program to improve fluency, or Making Meaning, a literature-based vocabulary and comprehension curriculum for LEP students. These and other resources are used to supplement the regular curriculum for students needing extra help.

Math Intervention

There is no pull-out intervention for math, so math intervention teachers work in the classroom co-teaching, leading small groups, and working with individuals as needed. Teachers like to use the "hot seat" method to sit one-on-one with individual students to offer a few minutes of direct instruction or guided practice. Data analysis helps teachers identify individual students' needs. While there are no specific math intervention programs used in the school, teachers reported using a variety of strategies and resources, including online programs, to differentiate instruction for students. Teachers also do target pre-teaching and re-teaching with students.

Assessments

North Frederick uses a variety of state, district, and school/classroom-based assessments to monitor student progress and identify individual learning needs. Data from these assessments guide instruction and determine goals for individual teachers and for the school as a whole

Quarterly benchmark data for math and reading are collected from the district-wide Performance Series Assessments. First quarter data are used to establish a baseline, second quarter data help set benchmarks, and third quarter data allow teachers to assess how students are progressing toward the standards. Data are analyzed individually, at grade-level team meetings, and at quarterly progress meetings. Data from the district's reading assessment identify students for reading intervention and help the reading specialist determine which intervention program is needed. School-based, online reading assessments provide supplemental data to monitor progress between the quarterly assessments. In math, common unit assessments provide grade-level, classroom-level, and individual student data. Common formative assessments are completed in a notebook that students take with them from grade to grade in order to help track progress across the years.

A school-wide emphasis on data-driven instruction shapes teaching and assessment practices. Teachers receive regular training on accessing and interpreting data. The school employs a formative assessment/technology specialist who coaches teachers, both individually and during professional development sessions, on developing and using classroom-based formative assessments and using the school's rich technology resources to support assessment and data collection. Teachers use tools such as Google Classroom, along with traditional methods such as exit slips and wipe boards, to give daily

formative assessments. Students in grades three through five have individual tablets, so teachers are creating more and more online activities to assess students, provide feedback, and collect data.

Teachers noted that PARCC assessments will provide new data and, potentially, some new challenges. They expressed uncertainty about how their instruction aligns with the new assessments. They expressed the need for ongoing professional development to understand how PARCC assessments will shape curriculum.

Extra Help Strategies for Students at Risk of Academic Failure

There are a variety of programs and supports in place for students who struggle with academics, behavior issues, attendance, and social/emotional issues. Resources to support students at risk of academic failure include a strong support staff, readily available materials and resources, an Extended Learning Opportunity program, and a student-mentoring program. In addition, a number of specialized teams meet regularly to address the needs of students at risk of academic failure and many teachers participate on at least one team or committee beyond their grade-level team. There is strong school-wide communication and collaboration around supporting students.

Staffing and Resources

Intervention teachers provide support for special education students, LEP students, and students who need extra help with reading, math, speech, or behavior. Instructional aides also work with small groups and individuals. The intervention teachers use assessment data to identify learning needs and determine appropriate interventions. They also work with classroom teachers to plan and modify instruction for subgroups and individuals, and to monitor students' progress. Strategic grouping facilitates the work of the specialists. When creating classes, the administration groups students with similar intervention requirements so that specialists can more effectively deliver the necessary supports.

The reading intervention teachers work with groups and individuals in grades prekindergarten through five. Early intervention is an important part of this work, and the school draws from a variety of resources to support struggling readers. Specific reading interventions are described above, but it is important to note again that the school had access to a wide variety of intervention materials so that students receive targeted support. Reading support is provided both in the classroom, with intervention staff and aides leading small groups and working with individuals, and also in pull-out settings, when students leave the classroom for extra help while the rest of the class works on independent reading activities.

Almost all math support is provided in the classroom, rather than in pull-out settings. Math intervention teachers co-teach with grade-level teachers, lead small groups, and work with individuals. There are no math intervention programs used; rather, teachers and specialists select or design resources to meet individual needs through a process facilitated by the district's curriculum and the expertise of instructional coaches. In classrooms with a large number of students who need support, there are as

many as four adults (teacher, intervention teacher, and aides) present for the math lesson. This extra help maximizes individual instruction.

Behavior and Attendance Support

North Frederick has concentrated efforts in maintaining high student attendance. The principal noted that the staff places such a high value on attendance because "students cannot learn if they are not in school." As such, there are a variety of supports and incentives in place to increase attendance. The community liaison calls the home of any absent students who have been identified to be chronically late or absent. She will work with students and families to address problems that affect attendance. For example, the community liaison might help coordinate rides for a student or provide an alarm clock to help a child wake up on time. The school's attendance team meets weekly to review data and address attendance issues. The district's pupil personnel worker visits the school weekly and provides follow-up support for students with poor attendance. Teachers also call home if a student misses more than two days in a row.

In addition, individual students and whole classes can earn rewards such as pins, certificates, and movie-showings for good attendance. Before-school programs are offered to targeted students, and students are invited to fun morning workout sessions on days when there is a two-hour delay to increase attendance.

As a Positive Behavior Interventions and Supports (PBIS) school, North Frederick implements the tenants of the PBIS framework. The school rules are simple and consistent: "Be ready. Be respectful. Be responsible. Embrace rigor." These four R's constitute "Freddy Ready" behavior and are reinforced on posters, in curricular activities, and in the daily announcements. A token economy, award assemblies, and recognition for good behavior all support a positive school culture. In addition, the school support specialist, guidance counselor, school support aide, and behavior intervention aide form a team to address the needs of students who need extra help to meet behavior expectations.

Extended Learning Opportunity Program

North Frederick has been allotted a number of 11-month positions by FCPS. The number of positions varies from year to year. At the time of this visit, there were 10 teachers funded for 11 months. The extra instructional time created by these positions is used to provide after-school support through the Extended Learning Opportunity (ELO) program. Targeted students gather in a club-like atmosphere, meeting after-school three times a week for one hour. Many of the students identified for the program are the "fence sitters," according to one teacher. In other words, students who need just a bit more help to be successful rather than those who require intensive intervention. The ELO teachers design fun and engaging activities to ensure that students are eager to attend. Groups are kept small, with only eight students per teacher, so students receive individual attention, and the school provides transportation.

The ELO program provides students with structure and resources for completing homework and practicing and extending learning. Younger students focus on reading and other students on math.

Teachers collect data to monitor students' progress. Teachers and administrators identified the ELO program as a leading factor in reducing the achievement gap for LEP and FRPM students. The intensive, individualized instruction has resulted in significant improvement in student achievement.

Student Mentoring

Another example of the North Frederick's commitment to reaching every student is the student mentoring program. This program allows teachers to work with and support students one-to-one. The administration and guidance counselor identify students for the program. These may be students who are experiencing distress due to a family situation or students with behavior or emotional issues. The teacher-mentor checks in with the child several times a week and can arrange to meet with him or her for conversation, lunch, or extra help. About 75 percent of the staff is involved in the program, which emphasizes the value of building and maintaining relationships. Students feel cared for and come to know that there is someone they can talk to and ask for help.

Specialized Teams

Teams address topics such as content-area learning, community outreach, behavior and school culture, and school improvement. For example, the Attendance Committee meets weekly to review attendance data and plan strategies to maintain high attendance. The School Support and Community Liaison staff members work with the Attendance Committee to provide support for students who struggle to get to school. Attendance interventions include incentives for good attendance, daily calls home when a student is absent, letters at parent conferences, discussions at each IEP and 504 meeting regarding attendance, and assistance with transportation. Another example is the reading intervention team, which is composed of the reading, speech, and LEP specialists. This team was assembled because the administration realized that many students who struggled in one of these areas also struggled in others. The team can work together to review data and plan interventions for students who struggle with language and literacy. Every team, from the ELO teachers to the Attendance Committee, relies on a careful review of data to inform their work.

Other groups meet formally and informally to continually assess students' needs and provide targeted support. There is heavy emphasis on meeting the needs of each student, building relationships with students, and involving families and parents, and these teams are responsible for implementing strategies for meeting these goals.

Professional Development

The principal noted that North Frederick teachers are learners and that they receive extensive school-based and district-sponsored professional development. The strong commitment to ongoing, relevant, and structured professional development positively impacts school culture and student learning.

District-wide professional development sessions have included training on using the FCPS curriculum and data sites. At the school-level, the administration identifies needs and designs professional development accordingly. For example, teachers have attended sessions about the PBIS framework and

cultural/diversity awareness training[34] that they described as "very valuable" for building understanding and strategies for teaching a diverse student body that includes a large percentage of FRPM students.

The school's commitment to professional development is apparent in the scheduling of weekly grade-level professional development meetings. These sessions are in addition to daily planning time. Topics for these sessions are guided by the School Improvement Goals and include exploring curriculum, analyzing data, and learning about best practices. Each session includes a "bridge to practice" assignment that teachers use in their classroom and report on the results the following week. Reading and math specialists are trained to lead these sessions and set the weekly agenda.

School Culture and Leadership

There is a culture of high expectations and hard work at North Frederick Elementary. Teachers reported that the administration sets a high bar for them and provides supports for them to reach their goals. They also noted that teachers hold high, uniform expectations for students from prekindergarten through grade five. These expectations are supported by the school's rules: "Be ready. Be respectful. Be responsible. Embrace rigor." The "four R's," as the rules are called, are reinforced through daily announcement, posters, and class activities.

The administration has also been proactive in promoting a school culture that embraces diversity and encourages relationships. The staff has completed professional development based on the work and research of Ruby Payne, which emphasizes multicultural understanding, understanding poverty, and the importance of relationships in students' success. Teachers noted the impact that this training had on their work with students, especially low performers, and families. They acknowledged it as an important factor in promoting a positive school culture.

The teachers and administration strive to make school a positive, welcoming place for parents and students. Many of these efforts are led by the parent involvement committee. Parental involvement is encouraged through frequent and regular communication, family activity evenings, website and email updates, and calls home. During the first month of school, teachers are required to have a positive interaction with all parents in order to set the tone for the year. This usually involves a call or letter to tell parents about positive behaviors and achievements. The school's family involvement committee works to promote communication and invite parents to attend school activities such as the annual parent breakfast or evening events. They also develop ways to help parents understand the curriculum and provide tips for how parents can assist in their children's learning.

[34] This training was based on Ruby Payne's work "A Framework for Understanding Poverty."

Summary

North Frederick has made significant progress in reducing the achievement gap between subgroups within the student body. The following factors have contributed greatly to the school's success:

1. Data driven instruction. North Frederick staff and administration regularly collect and review data to set all goals and to monitor progress toward achieving those goals. Data analysis is central to the planning and instruction of all teachers, including in the Extended Learning Opportunity program. Data also inform school policy and practice on attendance, behavior, and school goals.
2. Extended Learning Opportunity program. This program provides additional after-school support for students who are performing below their peers. It is made possible by additional funding from the district.
3. Extensive, deliberate professional development. Regular, structured, and targeted professional development allows teachers to refine their practice by learning, collaborating, and reflecting on best practices.
4. Strong leadership. The principal sets high expectations and provides abundant support to teachers. She leads her team in identifying and implementing school-wide strategies that impact student learning and behavior, and she places strong emphasis on continuity and collaboration. There is mutual respect between the principal and staff.
5. Full support staff. The school's large support staff includes instructional specialists and aides, behavior support personnel, and instructional coaches. Teachers and students benefit from the expertise and assistance of the support staff, which provides academic and behavior intervention, instructional resources, extra hands in the classroom, and professional development. There is a collaborative team approach to educating students, improving instruction, and cultivating a positive school culture.
6. School-wide emphasis on meeting the needs of each student. Teachers use a variety of resource materials to differentiate instruction and engage students. Much of this individualized instruction is driven by regular data analysis at the individual student-level. Early and ongoing interventions have contributed to students' success.
7. Time for collaboration and communication. Grade-level teachers share common planning time every day and required weekly collaborative planning meetings facilitate communication. Specialist and aides regularly plan with core teachers.
8. Positive school culture. As a PBIS school, North Frederick sets high expectations for students and teachers. The staff strives to make school a safe, positive, and engaging place where students want to be. The high attendance rate is important to the school's success. Regular efforts to invite parents and community members into the school also promote a welcoming environment.

The principal and staff have worked hard to reduce the achievement gap. When asked about challenges that will affect continued improvement, they identified several issues:

1. Changing student population. The principal and staff anticipate growing numbers of FRPM students and students with behavioral or emotional needs. The principal noted that schools need to serve both the students and the families who struggle with poverty. Additional resources, both physical and personnel, will be required to meet these needs.
2. Funding. Resources such as the ELO program and the full support staff are vital to North Frederick's success. Any budget cuts would negatively impact these resources. Funding cuts would likely lead to larger class sizes, which if combined with fewer support staff, would increase teachers' workloads and reduce their ability to deliver individualized instruction. The principal noted that budget cuts affect every area of resources.
3. Evaluations systems and new assessments. Teachers expressed concern about how to best prepare students for the PARCC assessments. The data they receive from this year's test will be informative and help guide instruction, but there is a sense of anxiety about how the new exams will impact the students and the school. Teachers also noted that parents struggle to help their children with the new math curriculum. Recent changes in accountability and teacher evaluations also increase the workload and anxiety of teachers.
4. Time. New initiatives and curricular materials, increasing student needs, and larger class sizes place heavy demands on teachers' time. It is important to provide time for collaboration and professional development to balance these demands.

Alignment with the Evidence-Based Model

Many strategies implemented at North Frederick Elementary align with the EB model:

1. Clear measurable goals. School-wide goals and individual teacher goals relate to student performance. Data are used to measure progress.
2. Effective curriculum and instruction program. The comprehensive district curriculum, key pedagogical strategies, and effective organization of instructional time are factors that facilitate students learning.
3. Sufficient staffing. The school employs enough core teachers to keep class sizes fairly small and enough elective teachers to provide adequate student-free time for core teachers to plan and meet. The large support staff provides instructional support for students and extra help for teachers.
4. Collaboration. Grade-level teams routinely plan together. Teachers collaborate to address student needs (ex. progress meetings) and school-wide goals (ex. attendance committee). There is a spirit of collegiality and support within the staff.

5. Data-driven decision making. Teachers are trained and supported in using disaggregated data to inform instruction. Data inform all school policies and initiatives, including behavior programs, attendance intervention, and the ELO program.
6. Deliberate and ongoing professional development. Teachers at North Frederick are continually learning and studying their practice through regular, targeted professional development. Every teacher participates in weekly PD sessions during the school day.
7. Interventions for students at risk of academic failure. The school provides early intervention in reading through a wide variety of curricular programs and resources materials. The staff of reading and math specialists, intervention teachers, and instructional aides facilitates ongoing support in reading and math. A school-wide commitment to individualized instruction promotes success for all learners.
8. Development of instructional leadership. Teachers are trained to lead their colleagues in data analysis, planning, and problem solving. Teachers are also leaders and members of a team that work on school improvement initiatives such as attendance or parent involvement. There is a feeling of partnership here, with teachers taking ownership of the success of the students and school.
9. Accountability. Teachers and administrators work together to meet school and student needs. Teachers set goals during quarterly progress meetings and must report on their efforts to meet these goals. Students are also instilled with a sense of accountability through the school's emphasis on the "Four R's:" Be ready. Be respectful. Be responsible. Embrace rigor.
10. Strong leadership. The principal sets high expectations for teachers and provides the supports they need to reach their goals. There is mutual respect between the administration and teachers.

Overall, many of North Frederick's features and resources are aligned with the EB model. These include fairly small class sizes, an appropriate ratio of core to elective teachers, instructional coaches, a full staff of intervention teachers and instructional aides, and additional programs and initiatives to support students at risk of academic failure.

Chapter VIII: North Hagerstown High School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Submitted by
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Executive Summary

North Hagerstown High School is an example of the first category of schools – a high performing school.

North Hagerstown High School (NHHS) is one of two high schools that serve the City of Hagerstown in Washington County Public Schools. The school offers grades nine through 12 and has an International Baccalaureate (IB) program and a range of on-level, honors, and Advanced Placement (AP) courses. In December 2014, 1,280 students were enrolled at NHHS. The student population is diverse both economically and racially. From 2004 to 2014, the number of students who receive free and reduce-priced meals (FRPM) increased from 26.6 percent to 47.3 percent.

North Hagerstown High was identified for this case study because of the high performance of students on the Maryland High School Assessment (HSA) between 2008 and 2013. During these years, an average of 92 percent of students performed at the proficient or advanced levels. Much of this success can be attributed to an instructional program called the Matrix, which involved all grades nine and 10 English students and all Algebra I students. In math, the Matrix program featured collaborative planning and teaching; flexible grouping; intensive, targeted instruction; and frequent data analysis. The English Matrix involved teams of teachers working with groups of students throughout grades nine and 10 with clear goals for intervention, enrichment, and growth for each student. Grant funding paid for teachers' time for after-school planning and small learning communities, which promoted collaboration and a positive school culture. These funds also provided subject area specialists in English and math, who helped teachers with planning and data analysis. This program lost funding in 2011 and was not in place at the time of the site visit in 2015.

Other factors that contributed to student success include strong and supportive leadership at both the school and district levels, and meaningful professional development (PD) opportunities. Advanced Placement and International Baccalaureate programs increased academic rigor. A variety of programs and personnel were in place to meet the academic, social, and emotional needs of students at risk of academic failure, including a school-wide advisement program, tutoring programs, special education programs, and other interventions.

It should be noted that significant changes have occurred in the school and district in the past few years that have impacted instruction, student performance, school culture, and professional development. The district's superintendent, who was named the national Superintendent of the Year in 2010, retired in 2011, and the longtime North Hagerstown principal retired in 2012. These changes led to staff turnover and other challenges that have affected school culture. The district's recent change from block scheduling to 50-minute periods has also affected instructional practices, reduced the amount of time for planning and collaboration, and altered the pacing of the school day. Under the new schedule, teachers have less time to integrate multiple activities and practice opportunities into each class session. Students can take a maximum of 24 credits rather than the maximum of 32 they could take with block scheduling, leaving students with fewer opportunities to take electives or retake courses they have failed.

Another significant change was the end of a grant that funded the highly successful Matrix program. The grant funded small learning communities, additional staff positions, and time for after-school planning, all of which were identified by the faculty as key components of improving student performance. Taken together, these changes posed multiple challenges for the school, and student performance declined in 2012 and 2013.

Introduction

North Hagerstown High School (NHHS) is one of two high schools[35] that serve the City of Hagerstown in Washington County Public Schools. Students come from two middle schools, which in turn draw from many elementary schools. The student population is both economically and racially diverse.

The school offers grades nine through 12 and has an International Baccalaureate (IB) program and a range of on-level, honors, and Advanced Placement (AP) courses. It also offers a full range of extracurricular activities including athletics, band and chorus programs, and a variety of clubs focusing on art, robotics, drama, education, and other areas.

In December 2014, 1,280 students were enrolled at North Hagerstown High School. Table 1 shows enrollment by grade-level. Student attendance has remained consistent at 94 to 95 percent over the past decade.[36] In that same time period, student mobility has ranged from a high of 24.9 percent in 2006 to a low of 16.4 percent in 2010. The rate was 19 percent in 2014. The principal noted that many transient students go back and forth between North Hagerstown High and South Hagerstown High, the other high school in the city. The two schools are increasing communication to facilitate the transition of these students.

Table 1
North Hagerstown High School Class Sizes December 2014

Grade-level	Enrollment
Grade Nine	387
Grade 10	331
Grade 11	274
Grade 12	288

Over the past decade, there has been a large increase in the number of FRPM students at North Hagerstown High. In 2004, 26.6 percent of enrolled students were identified as FRPM, and that number increased to 47.3 percent in 2014 and to 49.4 percent in 2015. The number of students identified as limited English proficient (LEP) and the number of students enrolled in special education have changed

[35] Both high schools are similar in size and demographic makeup.
[36] The school is implementing a new attendance system that tracks attendance by period rather than by day, so the principal anticipates a drop in these numbers in future reports.

little across the past decade. Table 2 shows the demographic characteristics of the North Hagerstown High student body.

Table 2: North Hagerstown High School Student Characteristics 2014-15 school year

Student Characteristics	Percentage of Student Population
Race/ethnicity	
American Indian/Alaska Native	0.2
Asian	2.7
Black/African American	23.3
Hispanic/Latino	7.2
Native Hawaiian/Pacific Islander	0.2
Two or more races	7.9
White	58.5
Eligible for free or reduced-price meals (FRPM)	49.4
Limited English Proficient (LEP) students	1.8
Special education students	9.6

North Hagerstown High School experienced significant changes in the past several years that have impacted instruction, student performance, school culture, and professional development. There have been several changes in the administration of both the school and the district. The district's superintendent, who was named the national Superintendent of the Year in 2010, retired in 2011 and the long-time North Hagerstown principal retired in 2012. These changes led to staff turnover, new policies, and other challenges that have affected school culture. For example, the successful student advisement program was discontinued and funding for professional development was greatly reduced under the new district leadership. The district's recent change from block scheduling to 50-minute periods has also affected instructional practices, reduced time for planning and collaboration, and impacted the pacing of the school day.

Another significant change was the ending of a federal grant in 2011 that funded small learning communities and their work with the highly successful Matrix program, an instructional approach that allowed teachers to regroup students for specialized instruction and intervention in math and English. The grant funded additional staff positions and time for after-school planning, both of which were identified by the current faculty as key components of improving student performance.

School Performance

North Hagerstown High was identified for this case study because of the high performance of students on the Maryland High School Assessment (HSA) between the years of 2008 and 2012. In 2013 and 2014, there was a slight drop in overall student performance and a larger drop in the performance of

subgroups. These shifts contributed to the school moving from Strand 2 to Strand 5 on the School Performance Index.[37] This case study will explore factors that led to student success 2008-2012 and will identify factors that contributed to the drop-in student performance in the past two years.

Table 3 shows the HSA student performance for all students (averaged) and for subgroups. Between 2008 and 2014, an average of 91 percent of students performed at the proficient or advanced levels, making North Hagerstown one of the top performing high schools in the state.

Table 3
North Hagerstown High School Performance, Maryland High School Assessment (HSA), 2008-2013

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science							
Performance Level	**HSA 2008**	**HSA 2009**	**HSA 2010**	**HSA 2011**	**HSA 2012**	**HSA 2013**	**HSA* 2014**
All Students	88	90	91	93	95	93	88
Free and Reduce-Price Meals (FRPM) Students	76	83	87	85	91	87	NA
Special Education Students	53	73	83	84	80	68	NA
Limited English Proficient (LEP) Students	-	-	-	-	-	-	NA
Non-White/Non-Asian Students	80	84	88	86	93	92	NA

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

*Assessment data by student subgroup for 2014 were not available at the time this report was written.

School Staffing

The North Hagerstown High administrative team consists of a principal and three assistant principals. The principal was new to NHHS in 2014-15. She was previously the principal at one of the district's middle schools.[38] The instructional staff includes 53 core subject teachers and 15 elective teachers, along with eight special education teachers, an LEP teacher, and two instructional coaches for math and English. The staff also includes a guidance counselor for each grade, a full-time librarian, an IB program coordinator, and a team of instructional aides and support staff. Table 4 shows the breakdown of school staff by full-time equivalent (FTE) position.

[37] The School Progress Index evaluates high schools on indicators of Achievement, Gap, and College and Career Readiness. See http://www.mdreportcard.org/SpiOverview.aspx?PV=14:0:21:2101:3

[38] Update: Since this report was drafted, the principal moved to a position in the district's central office. A new principal for NHHS was appointed.

Table 4
Staffing at North Hagerstown High School

Category	FTE
Administration	
Principal	1.0
Assistant Principals	3.0
Athletic Director	1.0
Clerical (Includes 2 secretaries for Counseling Center)	7.0
Main Program	
Core Teachers English – 13 Math – 12 Science – 11 Social Studies – 11 Foreign Language – 6	53
Elective Teachers Music – 3 Art – 2 Physical Education/Health/Life Skills – 6 Family and Consumer Science – 2 Career Technology – 2	15
Special Education	8.0
English Language Learners	1.0
Library Media Specialist	1.0
International Baccalaureate Coordinator	1.0
Instructional Coaches	2.0
Aides	
Instructional Support	7.0
Intervention Services Specialists	2.0
Pupil Support	
Licensed	
Social Worker	1.0
Guidance Counselors	4.0
Non-licensed	
Custodial Staff	9.0
Lunchroom Staff (14 part time. Exact number of FTEs could not be determined.)	
Contracted Positions	
Nurse	2.0
Athletic Trainer	1.0

The North Hagerstown staff includes several positions that are shared with other schools in the district. These positions include a pupil personnel worker, a school psychologist, a speech pathologist, and a computer technician. The pupil personnel worker serves as a liaison between school and families, helps address issues such as attendance, crisis support, and residency, and arranges counseling and advocacy services as needed. The school's social worker also facilitates these efforts.

The special education staff works with several different programs and initiatives. There are four special education teachers who support specific content areas – one in math and three in reading. These teachers provide pull-out instruction for individuals and small groups of students. Two special education teachers and three paraprofessionals work with non-diploma seeking students in the Life Skills program. The Summit program supports students with emotional challenges and is staffed by two special education teachers and two aides. Two aides work with students in the special education resource room, with one aide in the room each period and the other providing support in subject area classrooms.

School Goals

In its annual School Improvement Plan (SIP), North Hagerstown administrators and staff outline several goals for student and school performance. For 2014-15, the three broad goals are as follows:

1. Identify and implement research-based instructional and assessment strategies to increase student achievement.

2. Increase parent and community involvement.

3. Implement research-based school-wide programs and strategies to address student discipline, increase student attendance, and reduce suspensions and student dropouts.

The Action Plan includes multiple action steps, target dates, and required resources for meeting these goals. For example, some of the action steps for goal one include providing differentiated professional development opportunities, providing a variety of academic enrichment and intervention programs, and implementing an instructional help period for students at risk of academic failure. Action steps for increasing parent and community involvement include hosting student recognition events, increasing positive communication with families, and hosting college prep events, among other things.

In addition to the school-wide goals, teachers set individual student performance goals through student learning objectives (SLO). The school also uses the Classroom Focused Improvement Process (CFIP) to collaboratively analyze student learning data and set goals for individual students and whole classes.

School Schedule

Until 2014-15, North Hagerstown operated on a block schedule with four 90-minute periods per day. Courses were one semester long with students beginning new classes each fall and spring term. In the

2014-15 school year, the school switched to the district-recommended six-period day with each period lasting approximately 50 minutes. Most courses run for the full academic year. The rationale for this change was to provide students with continuous instruction in core subjects – especially reading and math – to make sure they are ready for the PARCC exams, which were administered for the first time in spring 2015.

The school day at NHHS is from 8:45 a.m. to 3:30 p.m. Students have six periods of instruction. To accommodate four lunch rotations, fourth period includes a half hour for lunch and a 90-minute block for instruction. During this block period, students can receive extra help from teachers or they can enroll in semester-long math, science, or language courses, which allow them to catch up if they are behind or prepare them for higher-level courses in their senior year.

Collaborative Planning Time

Teachers have one planning period each day. Teachers are required to attend a CFIP meeting every Wednesday during their planning time. These meetings include all teachers who share the same planning time and cut across subject areas and grade-levels. During CFIP meetings, the principal leads data analysis and goal-setting activities. Department meetings and faculty meetings are held monthly, but planning is not the focus of these sessions.

At the time of the site visit there were no structures or schedules formally in place for collaborative planning, such as scheduled team or unit planning time. Teachers noted that they informally share ideas and resources with others who teach the same subjects. Special education teachers communicate with content-area teachers regularly to plan for specific students and to align instruction. Instructional coaches are available to assist teachers with planning, but there is not a formal system or schedule for these meetings.

In the past, there was a more deliberate approach to collaboration. The school received federal funding from a grant to create and support small learning communities (SLC) that allowed subject-area teams to plan together. Teachers in these SLCs worked closely to create and implement a Matrix program, described below, from 2005-2011. Much of this planning occurred before and after-school and teachers' time was funded by the grant. In addition, the school employed Subject Area Specialists (SAS) to plan with Matrix teams and content area teachers. These positions ended when the grant expired in 2011.

Many teachers feel that the longer planning periods permitted by block scheduling facilitated communication and collaboration between team members and with the special education staff. They noted that their current, shorter planning periods do not allow for collaboration since there are so many other things they must accomplish in the 50 minutes. Also, the end of funding for collaborative planning time has negatively impacted both instruction and school culture since teachers no longer have time to work as a team.

Curriculum and Instructional Program

North Hagerstown High offers a standard high school instructional program that includes core academic classes and required and optional electives. According to the district's 2015-16 Program of Studies, students must earn 24 credits to graduate (English-4; Math-4; Science-3; Social Studies-3; Physical Education, Life Skills/Wellness, Fine Arts, and Technology-1 each; electives-6). Other graduation requirements include:

- Complete the requirements for a University of Maryland Completer program (two world language credits and four math credits) *or* a Career Technology Completer program (students can choose from several career and technology programs);
- meet the state required scores on assessments; and
- complete a minimum of 75 hours of approved student service learning hours.

Washington County Public Schools follows the Maryland College and Career-Ready Standards (MCCRS). While teachers have general curricular guidelines, there is great variation on how teachers approach content in their individual courses. Some math teachers noted the vague nature of the math curriculum under MCCRS and the need for more time to collaboratively plan and develop curriculum together.

When asked about the school's past success in increasing student performance and reducing the achievement gap, teachers identified several factors. These included longer class periods; intensive individualized instruction via the Matrix program; and support and enrichment programs, including advanced course offerings, the AVID program, and early college options.

Instructional Time

As noted above, NHHS operated with 90-minute periods until the 2014-15 school year. Teachers found that there were many advantages to block scheduling, including the fact that students had the opportunity to take more classes across their high school career. Students could take up to eight classes per year, for a total of 32 credits, whereas they are only able to take a maximum of 24 credits (six classes per year) under the new schedule. Teachers felt the block schedule offered students more flexibility and more chances to succeed.

Under the new schedule, students have fewer course choices. For example, several years ago, the social studies department merged U.S. Studies and Government into a two-semester course for grades nine and 10 students. The integrated course helped students make connections across the two subjects. This year, however, the department reverted to offering the two courses separately due to the new schedule. Other electives, such as journalism, drama, and creative writing, have either been removed from the curriculum, or students do not have the time in their schedule to take them. Teachers noted these changes reduce the overall opportunity for exploration, creativity, and curiosity in school.

The block schedule offered other advantages, including more time for individual and collaborative planning. One teacher said, "We had more time to meet as a team to review data and think about

student grouping." Longer class periods gave teachers opportunities to build in more activities and transitions to keep students engaged and provide practice and enrichment opportunities.

Matrix Program

Teachers universally acknowledged the significant role the Matrix program played in improving student achievement. The Matrix program grew out of the small learning communities that were funded from 2004 to 2011 by a federal grant that allowed the school to hire additional staff, and supported before- and after-school planning meetings and professional development. The program featured intensive data collection and analysis, collaborative planning, and strategic, flexible grouping. Subject Area Specialist (SAS) teachers, who were content-area experts, facilitated data analysis, planned with teachers, and recommended relevant resources.

The Matrix program involved all grades nine and 10 English students and all Algebra I students. Teachers worked in SLCs to plan and review data on each student. The key instructional strategy was strategic flexible groupings, especially in math. Algebra I students were grouped based on performance and could be moved to another group as soon as they mastered the necessary content. Intervention was immediate and targeted for each student. One math teacher said, "Kids were never backing up, so there was never a sense of failure." Another noted, "In the Matrix, students didn't have the option of failing. And you also could advance the ones who needed to be challenged. Success created success for students." Teachers on the team could co-teach or trade classrooms for certain lessons if one teacher was particularly strong on a given topic.

In the English Matrix, grade nine students were divided into three groups, or "houses," of approximately 120 students. Each house was assigned a team of English, social studies, and science teachers – seven total – who provided subject-area instruction to these students for grades nine and 10. Within each house, students were grouped into three broad categories: 1) prepared for grade-level English, 2) prepared in reading but needing writing support, and 3) requiring reading intervention. Specific course plans and resources were selected for enrichment, intervention, and remediation for the students in each category. The "house" approach is similar to a team approach where a group of teachers collaborate and plan together and attend to individual and whole-class needs.

The Matrix program gave teachers the time and tools they needed to analyze disaggregated data, identify the needs of each student, and develop plans and strategies to meet those needs. When funding ended, the collaborative planning time also ended and there were no longer SAS positions, which meant that teachers no longer had the time and support needed to run the highly successful Matrix. One teacher described the change from proactive intervention to reactive intervention: "Individualized instruction has greatly decreased. Now, it's a lot more time doing catch-up. It's all clean up."

AP and IB Programs

Another factor that contributed to the success of NHHS students was the introduction of the

International Baccalaureate (IB) program. Along with the Advanced Placement (AP) program, the IB courses provided opportunities and academic rigor for students. The district's Program of Studies describes the IB program as follows:

> IB requires students to complete college level courses in six academic groups while also completing a Theory of Knowledge course, writing an Extended Essay and participating in Creative (the arts), Action (physical activity) and Service (community service) activities. These requirements insure students are prepared for a college education by providing students with a freshman college experience during the students' junior and senior years of high school.

In 2014, an all-time high of 98 students participated in the IB program, with 18 earning IB diplomas and 80 earning IB certificates. In 2013, 23 students earned IB diplomas and 36 earned IB certificates. The pass rate for students taking IB exams in 2012-13 was 82.5 percent.

The school offers AP courses in English, math, science, and social studies. Any student can enroll in an AP course, with or without a teacher's recommendation. This leads to a wide range of abilities within the AP classes and might challenge some students to push themselves to higher levels of achievement. Students are not required to take the AP exam, but the district pays for half of the cost if a student does wish to take it. In 2014, 71.9 percent of students enrolled in AP courses sat for the AP exams. Students had a 45.2 percent pass rate (a score of three to five) on the exams. When the school began offering honors courses several years ago, AP enrollment dropped.

AVID (Advancement Via Individual Determination)

AVID is a four-year program designed to help B-level and C-level students prepare for college eligibility and success. These students are academically capable and willing to work hard, but are considered as not living up to their potential. If they are interested in the program, they complete an application and interview process and are then enrolled in a college-preparatory course of study and attend tutoring sessions twice each week. Parent engagement is an important component of the program. Parents must sign a contract agreeing to support their students' academic success and the requirements of the AVID program, including attending parent meetings.

Early College Options

NHHS is part of a district-wide partnership with Hagerstown Community College (HCC). Academic success and rigor is encouraged through a variety of programs that allow students to take college courses while they are still in high school. For example, qualifying juniors and seniors can enroll in STEMM (Science, Technology, Engineering, Math, and Medical) Middle College, a dual enrollment program, or can pursue concurrent enrollment in high school and college. HCC gives students discounted tuition rates as required by Maryland law. Upward Bound, a program designed to help first-generation college students prepare for the academic and social demands of college is also offered at HCC and allows qualifying students to earn high school or college credits during the summer.

Extra Help Strategies for Students at Risk of Academic Failure

Several initiatives have provided students at risk of academic failure with extra support. Currently, National Honor Society members provide peer tutoring in every subject. Teachers also host before- and

after-school tutoring sessions, such as the popular Calculus Club, held Monday through Friday before-school and Monday through Thursday after-school. Students who fail a course by 10 percent or less can join the Apex program, which allows them to make up the failed portions of the course. Those who fail due to attendance issues are eligible for Wednesday or Saturday school programs to make up the missed time.

For students who struggle to pass the HSAs, there are academic remediation courses and a Bridge program. The Bridge program is for students who pass the HSA-related courses but not the exam itself. These students complete projects that demonstrate their content-area knowledge. The Bridge program consists of cohorts of students who meet for individualized tutoring and project support. Approximately 30 to 40 students participate in the Bridge program each year, and teachers noted that enrollment has increased. In previous years, they felt that students showed more reluctance to rely on the Bridge program to graduate, but now there is less of a stigma attached to the program.

In 2013, NHHS started a freshman academy. This is a team approach to teaching that grouped 75 students, targeted because of academic, social, or other challenges, into common classes. The administration hopes that sharing common experiences and teachers will help the students develop a support network among their peers and the staff.

There are also supports in place for students who need special education services. As described above, a team of special education teachers and instructional aides provide academic, social, and emotional support to students identified for these services. For students who are significantly below grade-level in reading, there is pull-out support using the Wilson reading intervention program and Just Words, a phonics-based program. There is currently no standard math intervention program used, but that is something the principal is exploring.

Other school staff, including the social worker and intervention services specialists, provide support for students with behavior or attendance problems, or students who face serious challenges such as pregnancy, criminal records, residency and family issues, or health issues. These staff members work with families and various public and private agencies to support students, and they serve as a consistent point of contact and support for compensatory education students. During weekly student support meetings, key staff members discuss individual students' needs and progress.

During the years when NHHS saw strong student performance gains, the school operated a daily advisement program that supported all students. There were daily, 20-minute meetings that grouped students from every grade-level into a small community of 16 to 20 students. The group stayed together with the same teacher for four years, with new freshmen added to replace the graduating seniors. The students formed strong connections with the teachers and with each other. Teachers saw upperclassmen giving advice to younger students, and they noted the positive impact on school culture. Teachers used this time for team-building activities, to provide homework assistance, and to help

students build schedules and develop four-year plans. It was an opportunity for continued one-on-one and small group support.

NHHS also offers support to students through the Twilight program, which provided preparation and remediation for HSAs. This program was implemented in 2006 and was funded by a mini-grant from the district's Director of Secondary Schools office. The funds covered stipends for teachers, resources and material purchases, and snacks and after-school transportation for students. This program provided individualized tutoring and training in test-taking technology. The grant, which must be applied for each year, has decreased in amount, and so the Twilight Program continues in diminished capacity.

Assessments

Teachers use a variety of classroom, district, and national assessments to monitor student progress. Classroom assessments are given regularly, but these evaluations are not standardized across classrooms.

Students take quarterly benchmark exams that are aligned with PARCC tests. These data are not broken out by topic or strand, as prior benchmark data had been, so teachers are not receiving the same level of detail from current district exams. PARCC exams were administered in spring 2015, and the staff anticipates learning a lot about the effectiveness of their test preparation and strategies based on this data. Students also take the HSA subject tests in spring 2015. Quarterly benchmark tests are given in non-PARCC subject areas.

Under the Matrix program, students were frequently assessed in math in order to determine appropriate grouping and support strategies. Teams worked collaboratively to find or develop appropriate assessments.

Professional Development

The district's Professional Development office was dissolved in 2012 and funding for professional development was greatly reduced. Under previous district administration, professional development was a priority that received more funding and support than it currently does. AP and IB teachers were able to attend important training and PD sessions that prepared them to deliver course content and lead other faculty. The district sponsored summer workshops that brought content area teachers within and across schools together to plan and share best practices. Teachers noted the great value of such collaborative meetings. Funding was available from the district for teachers to attend conferences and workshops to further develop their knowledge and skills, and teachers regularly shared their learning with other teachers at the school during collaborative planning time.

The Subject Area Specialists (positions that no longer exist) also facilitated planning and in-school professional development for content-area teachers. The SAS worked with individual and small groups of teachers to analyze data, plan lessons, and adapt material according to student needs. Teachers

found this type of coaching and support helpful. The current instructional coaches provide some of these services, but they are not subject specific personnel.

In 2005, the faculty of NHHS received professional development based on Ruby Payne's framework for understanding poverty, which examines the impact of poverty on students' lives. Several teachers noted that this training was very helpful in building understanding of some of the struggles students might face living in poverty.

Because funding for professional development has been greatly reduced, teachers have few opportunities for external professional development. AP and IB teachers noted this as a concern, since extensive training is needed to prepare new teachers for these programs and keep experienced teachers up-to-date. They also noted that attending PD workshops in person was much more effective than when one person attends and reports back to the staff on what he or she learned. One teacher described the situation this way: "Trained teachers come back invigorated and enthusiastic. When you have a group of teachers with that enthusiasm and understanding of the big picture, they affect the whole staff with their knowledge." Teachers recognized the value of professional development in building school culture and student performance, and they lamented the severe cuts that have been made in this area.

School Culture and Leadership

Teachers felt a high level of investment and ownership in their work when they were involved with the Matrix program, and the advisement and tutoring initiatives. Under the previous administration, there was support for collaboration and professional development, both of which contributed to a positive school culture. Teachers had time for communication and common goals and visions. However, North Hagerstown High has experienced significant shifts in both school and district leadership that led to staff turnover and new policies that have negatively impacted school culture. The district's nationally recognized superintendent retired in 2011 and the long-time North Hagerstown principal, who led during the school's successful years, retired in 2012.

Turnover in both the teaching staff and the school's administration has negatively impacted school culture. The new principal (appointed just this year, 2014-15) said that she entered a school where the staff was "fragmented," and lacked a common vision. She noted that there was not universal support for the school's goals, and many of the experienced teachers who led the school to success had left. However, several of the teachers expressed optimism that the newly appointed principal would initiate positive changes. They noted that they have seen an increase in the level of support provided by the administration.

Programs such as advisement and the Matrix provided a strong support network for students and helped build an environment centered on success. While these supports are no longer in place, the school does use a token economy (Hub Bucks) to reward positive student behavior, and many teachers

engage with students by advising extracurricular activities and clubs. The staff and principal were discussing the possibility of resurrecting the advisement program.

Summary

The success that NHHS experienced in improving student achievement and closing the performance gap can be attributed to several factors and past initiatives, including the following:

1. Small Learning Communities. These funded learning communities allowed teachers to meet outside of school hours to analyze data and plan instruction. Teachers noted benefits of such regular collaboration and communication; student performance and staff engagement increased significantly.
2. The matrix program. This academic support program proved to be highly successful in improving student performance, especially in math. It promoted differentiation for supporting each student for success. It also contributed to collaboration across the staff, thus affecting school culture in positive ways as well. The Matrix was created and implemented by the staff in SLCs.
3. Data-driven instruction. Data was at the center of the work done in the Matrix program. All grouping and instruction was based on the regular collection and analysis of data.
4. Subject Area Specialists. These specialists served as instructional coaches, provided support for data analysis, collaborated in planning efforts, and recommended relevant resources for teachers. This level of support facilitated teachers' work. Improved instruction resulted in improved student performance.
5. Advisement. This program grouped students with peers from across grade-levels and with a teacher who met with them daily throughout their high school career. Students built relationships and had a strong support network. Daily time together was used for targeted lessons, homework support, schedule planning, career counseling, and other important topics.
6. Support programs for students at risk of academic failure. Programs such as after-school tutoring, the Twilight program, and AVID helped students reach their potential by providing extra help and targeted intervention.
7. Strong leadership. Strong district and building-level leaders provided the guidance necessary for teachers and students to succeed. Administrators prioritized student learning, funded professional development, and unified the teaching staff.
8. Positive school culture. North Hagerstown High was characterized by an attitude of success. Both teachers and students felt supported in their work. Teachers were deeply invested in teaching and in connecting with students through programs such as advisement. Students' success was the expectation and the reality.

As this case study explains, NHHS has experience significant changes and challenges over the past few years and student performance data reflect this.

The principal and staff identified challenges that will have to be overcome as the school seeks to regain the momentum it experienced from 2008-2012. These challenges include the following:

1. New initiatives. Teachers have been introduced to many new initiatives in the last three years, including MCCRS, PARCC exams, SLOs, and data systems. These initiatives have required time and energy from teachers who have less time available for planning, grading, collaborating, and building relationships with students. Teachers felt overwhelmed by the amount of new work and said much of it was not connected in meaningful ways to instruction and student learning.
2. Professional development opportunities. Professional development opportunities, particularly content-specific PD, have been greatly reduced since 2012. In addition, AP and IB teachers no longer receive ongoing training, and there is a lack of targeted PD for new teachers who join these programs.
3. Instructional resources. Teachers described a lack of consistent, aligned curriculum materials available to support instruction under MCCRS. They felt that subject-specific instruction coaches or specialists would help meet the need for support, as would time for collaborative planning. Currently, there is a lack of both of these things. Teachers also noted the need for additional technology to support changing instructional practices and online assessments. For example, they would like more laptops available for instructions since the school currently has just the number of laptops needed for testing.
4. Time. Teachers felt pressed for time. Planning periods were used for logistical matters, so little time was left for collaboration with colleagues, meeting with students, or researching new resources and materials. Teachers desired more time for planning, data analysis, and collaboration in order to improve instruction and meet the needs of all students. They also expressed a need for more time to fully comprehend and implement the new initiatives required by the district.
5. Changing student population. North Hagerstown High has seen an increase in the number of students who require behavioral, emotional, or mental health support, and the principal anticipates that these numbers will continue to rise. The current support staff, which has a heavy caseload, will struggle to support additional students. More personnel and financial resources will be needed to meet this need. The principal also noted the need for more interventions for students at risk of academic failure who do not qualify for special education.
6. Funding. Many of the school's successful programs relied on grant funding that is no longer available. Funds are needed to pay for before- and after-school instruction programs and planning time, professional development, and extra staff.

7. School culture. The changes of the past several years, including changes in administration and the end of the Matrix program and small learning communities, have left the staff demoralized and fragmented. Students are also less connected to the staff and to each other since the advisement program ended. The new principal is working to rebuild unity and a positive school culture, and teachers seemed hopeful that under her leadership, the school will rebound.

Alignment with the Evidence-Based Model

Several strategies that helped North Hagerstown achieve high student performance levels align with the EB model. As this case study reveals, some of these features are no longer operating or have changed significantly. EB-aligned strategies are listed below, with dates to indicate when the feature was in place or if is a new or ongoing feature:

- Clear measurable goals. School-wide goals and individual teacher goals are related to student performance;
    - 2005-2011: Under the Matrix program, teachers articulated clear goals for each flexible group and each student.
    - Ongoing: The current School Improvement Plan outlines data-driven goals and action steps, although it is too soon to know if this process will result in improved student performance.
- Effective curriculum and instruction program.
    - 2008-2013: The Matrix program, AP and IB courses, and the AVID program are examples of instructional efforts that were in place when the school showed improvement in student achievement.
    - 2008-2014: Block scheduling allowed for more planning time, more course options and credit opportunities for students, and time for teachers to build in a variety of activities, enrichment, and practice into each class period.
    - Ongoing: Academic rigor is supported through AP, IB, and AVID programs.
- Interventions for students at risk of academic failure.
    - 2005-2011: The Twilight program, which provided after-school tutoring and transportation, has targeted students who needed extra support to be successful. Also, the Matrix programs, particularly for Algebra I, grouped and regrouped students during the academic year to meet the needs of each student.
    - Ongoing: A variety of programs and personnel support students who struggle academically, emotionally, or socially. The school employs a social worker, a team of special educators, and student support personnel to provide intervention and support. Programs such as APEX, the Bridge program, and Saturday school are designed to help students at risk of academic failure meet graduation requirements. The Twilight program continues in reduced capacity.

- Sufficient staffing.
    - 2005-2011: Grant money was used to hire additional teachers, create SAS positions (which are equivalent to instructional coaches in the EB model), and support staffing for before- and after-school programs.
    - Ongoing: Current staffing is adequate, but the special education staff members carry heavy caseloads. The number of administrators, secretaries, and core and elective teachers meets or slightly exceeds the recommendations of the EB model. The EB model would recommend more support staff (for example five guidance counselors, nine to 10 instructional aides) and more instructional coaches (six vs. the current two) for NHHS.
- Collaboration.
    - 2005-2011: Small learning community groups met regularly to plan and collaborate facilitated by a block schedule. This contributed to improved instruction and morale.
- Data-driven decision making.
    - 2005-2011: The Matrix program was a strong example of how data were used to guide instruction and grouping. Teachers received support for data analysis from the SAS teachers.
    - Ongoing: Data analysis support is provided during CFIP meetings. Teachers receive training in accessing and analyzing data.
- Professional development.
    - Under the previous district administration, there was more funding for professional development. Teachers were able to attend professional development sponsored by the district or by national educational organization, such as the AP and IB program. Teachers returned invigorated and equipped with strategies and idea

While some features of the EB model are currently in place at North Hagerstown High, these features were more numerous and robust in past years. The rebuilding process is under way, although the level of resources the school received in the past does not appear to be available.

Chapter IX: Parkland Magnet Middle School for Aerospace Technology Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

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Executive Summary

Parkland Magnet Middle School for Aerospace Technology is an example of the second category of schools – a high growth school.

Parkland Magnet Middle School for Aerospace Technology is located in one of the economically disadvantaged areas of Montgomery County Public Schools. The school has a diverse student population – 44 percent of students are Hispanic, 25 percent are African American, 18 percent are Asian, and 10 percent are white. Fifty-two percent of students are eligible for free and reduce-priced meals (FRPM).

Between 2007 and 2012, Parkland saw significant gains in student achievement on the Maryland State Assessment (MSA), particularly for subgroups. During this time period, the proficiency rates of FRPM eligible students rose by 20 percentage points and the performance gap between them and their more affluent peers decreased from 12 to seven percentage points. MSA proficiency rates for English language learners and special education students also increased by 34 and 21 percentage points respectively.

Interviews with staff members, the school's instructional leadership team, and the principal point to several factors that have contributed to these increases in student achievement:

1. Supporting teachers. The school's large instructional and support staff, combined with adequate resources and a strong focus on professional development have helped increase teacher retention at the school.
2. Focus on teacher collaboration and professional development. Teachers meet for collaborative planning and professional development every other day. Moreover, they participate in instructionally related activities every other day and have team meetings three times per month. Teachers' professional development is led by a staff development teacher and is focused on building teachers' knowledge and skills of Culturally Relevant Instruction (CRI) and Universal Design for Learning (UDL).
3. Instructional models aligned to student needs. The school used root cause analysis to determine which students or learning areas required the most support. Given the large number of minority students – and the persistence of the achievement gap – the school is implementing two new instructional practices better aligned to student needs. CRI places emphasis on teachers' use and integration of instructional resources and materials that reflect students' cultures. UDL provides students with multiple ways to learn and demonstrate their learning and is a tool for boosting student engagement.

4. Multiple interventions. Parkland offers a multitude of interventions to provide students with extra support and help. After-school tutoring programs are available for struggling and special education students. LEP students are required to participate in Saturday school (off-site) and receive double periods of instruction during the regular school day. There is a Scholars Coordinator who is charged with monitoring and supporting 60 minority students and moving their performance up. Students with behavioral issues are provided with supports and strategies in a stand-alone Alt 1 classroom. Finally, the school provides wraparound services through the Linkages to Learning program and initiatives such as Family Market Day that provides families with free food.
5. Positive school climate. The principal and school staff have built up a positive learning environment for students using a variety of motivational strategies. Students who earn good grades participate in an ABC party and those who are on the honor roll or earn straight A's receive VIP privileges. Positive Behavioral Interventions and Supports (PBIS) rewards students' positive behavior with Panther Paws that can be used to purchase items from the school store. Teachers respect one another as colleagues and as one administrator shared, "This is Parkland. This is different. It's this atmosphere, it's kind of like a party".
6. Specialized programming. Parkland is an aerospace magnet school and sets high expectations and rigor for students. Students take two science courses a year and are offered the chance to earn high school credits throughout grades six to 10. Additionally, they are afforded the opportunity to take multiple science electives in the area of robotics, engineering, astronomy and principles of flight. The school accepts students via lottery, but does not have admission requirements. Much of the science curriculum is crafted in-house and students view the school as a stepping-stone for getting into specialized high schools.
7. Strong school leadership. The school has benefitted from continuity in leadership and the development of a shared vision. The principal has a positive outlook and places emphasis on pushing all students and teachers to their potential. He is purposeful in his hiring and equally purposeful in creating a positive and rewarding learning environment. Importantly, the principal trusts his leadership team and staff to "do what they do best" and "run" with initiatives or programs they believe will be beneficial for the school.

Introduction

Parkland Magnet Middle School is located in Wheaton, which is one of the economically disadvantaged places of the Montgomery County Public Schools district. Wheaton schools have the highest FRPM rates and the highest percentage of Title I schools in the district. In fall 2014, Parkland enrolled 883 students

in grades six to eight. Overall, core class sizes averaged 25 students, with the following average class sizes by grade-level and subject shown in Table 1:[39]

Table 1

Parkland Magnet Middle School Class Sizes

Grade-level and Subject	Class Size
Grade Six	
English	25
Math	23
Science	27
Grade Seven	
English	26
Math	24
Science	26
Grade Eight	
English	25
Math	21
Science	28

The school offers a wide variety of core courses and electives. There are five English/language arts classes offered: Developmental Reading, Read 180 (remediation), Reading, English, and Advanced English. The number of sections for each class varies by grade-level. A variety of math courses are available within each grade-level including, Algebra (six, seven, and eight), Honors Geometry (seven and eight), Honors Algebra (eight), Math Investigations (six and seven), Math (six and seven), and Algebra Prep (eight). Students are offered a robust science program with courses in astronomy, robotics, aeronautics, and space. Some advanced and remedial courses include mixed grades. For example, one section of algebra has students from grades six, seven, and eight.

Parkland is an aerospace magnet school that draws in students from across the district. It is part of the Montgomery County Public Schools Middle School Magnet Consortium originally created in 2004 with a grant from the U.S. Department of Education to help retain students. The consortium includes three middle schools (Parkland, Argyle, and Loiederman) that have different areas of focus but share common goals. These goals include improving student performance, increasing student choices in middle school programs, and decreasing student socioeconomic isolation.

[39] Given the variety of offerings, average class sizes were calculated using the following rules: course could not include mixed grades and special education/resource classes were not included because they generally only contained five to eight students.

Many students take the bus to school, while the 20 percent of students who attend from outside of the consortia (i.e. do not live within the residential boundaries of the three schools) must rely on their parents to transport them. The school does not have a selective application process. Any student who is interested in the program may apply and be admitted via lottery. School enrollment has grown steadily over the years, from a low of 560 in 2005 to 883 in 2014.

The student body is 44 percent Hispanic, 18 percent Asian, 25 percent African American, and 10 percent white. Students come from many different countries. For example, in one class alone there were 14 different languages spoken among the 34 students. The majority of Hispanic students are from El Salvador. The school's demographics have changed in recent years, with a doubling of the Asian population and an increase in the rate of students eligible for FRPM.

Table 2 shows the number of students by student subgroup attending Parkland.

Table 2
Parkland Magnet Middle School Student Characteristics

Student Characteristics	Percentage of Parkland Student Population
Race/Ethnicity	
American Indian/Alaska Native	-
Asian	18
Black/African American	25
Hispanic/Latino	44
Native Hawaiian/Pacific Islander	-
White	10
Two or more races	3
Students eligible for free or reduce-priced meals (FRPM)	52
Limited English Proficient (LEP) Students	11
Special education students	10

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

Fifty-two percent of students qualify for FRPM compared to the average of 34 percent in the district's other middle schools. Eleven percent of students have limited English proficiency. This percentage has

increased over the past couple of years and is slightly higher than the district rate of nine percent.[40] Ten percent of students receive special education services, which is lower than the district rate of 11 percent. Starting in 2007, Parkland Middle School saw consistent improvements in student achievement across the entire school population and for many subgroups.

This case investigates how Parkland achieved the observed growth in student achievement. The report has 11 sections: 1) school performance, 2) school staffing, 3) goals, 4) school schedule, 5) curriculum and instructional program, 6) assessments, 7) interventions and supports, 8) collaborative teams and professional development, 9) school culture and leadership, 10) summary, and 11) degree of alignment between the school's strategies and the school improvement strategies embedded in the evidence-based (EB) funding model.

School Performance

Table 3 shows the composite data used to select Parkland Middle as a case study site. The percentage of students who are proficient or advanced across all subjects (reading and math in grades six through eight, and science in grade eight) was averaged to produce a number – percent proficient/ advanced – for each year from 2007 to 2012.

Table 3
Magnet Middle School Performance, Maryland School Assessment (MSA), 2007-2012

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA*2 013**	**MSA* 2014**
All Students	66	73	76	81	78	81	81	77
Free and Reduced-Price Meals (FRPM) Students	54	58	63	71	70	74	NA	NA
LEP Students	18	25	35	30	41	52	NA	NA
Special Education Students	36	46	54	64	57	57	NA	NA
Non-White/ Non-Asian Students	58	65	69	75	73	76	NA	NA

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

[40] The district rates presented are for middle schools only.

For 2013 and 2014, only "All Students" scores were available. During this latter two-year time period, the state's curriculum standards changed, but the test did not. Statewide test score results dropped over these two years. Schools that had a drop of less than one standard deviation were given preference for being included as a case study. Parkland's composite test scores did not drop in 2013 (remaining at 81 percent), but did drop to 77 percent in 2014.

The data demonstrate the growth that has taken place over the past several years. In particular, the MSA scores of students eligible for FRPMS increased by 20 percentage points between 2007 and 2012. Similar gains were made for special education students (21 percentage points) and larger gains were made in the test scores of LEP students (34 percentage points) and minority students (39 percentage points). These statistics are notable given the persistently large academic achievement gaps often seen for these subgroups.

This case attempts to tell the story of how Parkland produced these improvements in student performance. It draws on interviews with the school principal, classroom teachers, school administrators and support staff. Documents, such as the school schedule and school improvement plan were provided by the principal and supplemented with materials available on the school website and Maryland State Department of Education (MSDE) website.

School Staffing

The principal has been leading the school for the past eight years (2007 to 2015), so there has been consistent school leadership. One of the first initiatives he undertook as principal was to change hiring practices and to "choose good people." As he shared, "One of the most important things I do is hire good people and that's [why] hiring can be so stressful." He noted that "as [he] surrounded [himself] with a good team, everything [started] getting done." Now multiple staff members participate in teacher interviews and they "check everything […] we want to know about the candidate."

But hiring good people is not enough. The principal places a strong emphasis on providing the support necessary to keep them at the school. New hires are made "to feel at home" and provided with support from the staff development teacher during their first year. Teachers are provided with ample time for collaborative planning and professional development (PD) – they get one to two full 84-minute periods per day for this work.

Another initiative the principal undertook was to change the school climate, which in those years was quite negative and reflected by a teacher turnover rate of over 30 percent. That figure has now dropped to below 10 percent each year. The principal has transformed the culture into one where teachers feel supported and valued and enjoy working collaboratively. The principal emphasized that teachers' "close bond [was] a secret to part of my success for turnover" and that he did not tolerate staff members not getting along. "We don't need that discourse here. We have enough to deal with the kids and the parents…[than the] mucky muck of staff not getting along well."

Table 4 shows the school's staff by full-time equivalent (FTE) position. Parkland's administration includes a principal, an assistant principal, an assistant school administrator, and a magnet coordinator.

Table 4
Staffing in Parkland Magnet Middle School

Category	FTE
Administration	
Principal	1.0
Assistant Principal	1.0
Assistant School Administrator	1.0
Magnet Coordinator	1.0
Clerical/Support Staff	
School Secretaries	3.75
School Financial Specialist	1.0
Instructional Data Analyst	0.75
Building Maintenance	8.0
Security Assistant	2.0
Main Program	
Core Teachers	34.0
Elective Teachers (Music, Art, Physical Education, and World Languages)	13.0
Instructional Coaches	3.4
Special Education Resource	2.5
Special Education	4.5
Limited English Proficient (LEP) teachers	1.2
Interventionists: Alternative Programs, Reading Specialist, Academic Intervention	2.8
Compacted Instruction	0.2
Focus Teacher	1.8
Media Specialist	1.0
Educational Assistants	
Paraprofessional	0.5
Paraprofessional Special Education	4.375
Media Assistant	0.875
Pupil Support	
Licensed	
Counselors	4
Nurse	1
Speech Pathologist	0.8
Auditory Teacher (Deaf/Hard of Hearing and Vision Office)	1.0

Category	FTE
Non-licensed	
Lunchroom Staff: Manager, Workers and Aide	4.875

The staffing arrangement highlights not only the core teaching positions, but illustrates the role that teacher leaders and specialists play in supporting student learning. Table 9.3 shows that the school has 34 core teacher positions for 883 students in grades six through eight, which translates into an average class size of 25.97 students.

Team leaders are in charge of all the teachers who teach a certain grade. The school has six team leader positions and three are used to support specific programs at the school. For example, one team leader runs the school's Positive Behavioral Interventions and Supports (PBIS) program, another coordinates the LEP program, and another serves as the Scholars Coordinator. The Scholars Coordinator provides support to 60 minority students (with grade point averages between 2.5 and 3.5) via weekly meetings that cover test-taking skills and study skills. Team leaders monitor student data; help with behavior; and organize events and field trips for the whole grade-level, town hall meetings, field trips, and school committees. Team leaders also teach classes (one less period than their colleagues). The principal stated the programs supported by team leaders "really add to the school."

Content specialists are classroom teachers (they teach one less period than their colleagues) who are in charge of all the teachers in a certain content area. Content specialists have several roles, including working with teachers to implement instructional programs and conducting informal and formal observations of teachers to provide them with feedback and coaching. Team leaders and content specialists were positions created under former Superintendent Jerry Weast's middle school reform plan.

Focus teachers support a certain focus or need of the school. The 0.2 FTE staff allocation for compacted instruction is designated for supporting advanced grades four and five students who come to Parkland from other schools in order to take a compacted math course. Compacted instruction provides these students with accelerated math courses that condense the content (the content of six marking periods is condensed into four marking periods).

Assuming a six-period day, a standard formula for determining the number of elective teachers is to have the number of elective teachers equal to 20 percent of the number of core teachers, which would equal 7.48 positions for this school (0.2 x 34). The total at Parkland is 13 FTE (there are a total of 14 elective teachers, 12 are 1.0 FTE and two are part time). But Parkland has a block schedule that requires 33 1/3 percent elective teachers over core teachers, equaling 11.3 (0.333 x 34), which is slightly less than the actual FTE of 13.

The school has several teachers who provide instruction and support to special education students and to other students requiring extra support. There are self-contained special education classes in math

and English that include no more than 13 students. The school also offers inclusion classes where the special education teacher and a paraprofessional co-teach with the classroom teacher. A resource class is also available and provides students with homework support and organization and study skills. They have one reading specialist, one teacher charged with academic intervention and a 0.8 FTE teacher who works in the school's Alt 1 classes, which are for students with behavior issues.

There are 1.2 FTE LEP teachers for the school's 97 LEP students. Students classified at LEP levels 1 and 2 receive a double period of LEP instruction. Students in LEP levels 3 to 5 receive one period of instruction. LEP class sizes are small and range from three to 11 students.

Parkland has four counselors who are charged with helping students with bullying, scheduling, and social emotional learning. Additionally, the school has a speech pathologist (0.8 FTE), one auditory teacher (1.0 FTE), and one nurse (who is not paid out of the school's budget).

Teachers were regarded as the number one resource in the school. As one member of leadership team said, having more teachers leads to smaller and more manageable class sizes. Multiple staff members reiterated that financial resources can only be stretched so far, "I need funds to have staff do the job," and that they had to be deliberate about what investments to make.

School Goals

Rather than discussing specific goals, the principal shared Parkland's mission statement:

> At Parkland, we believe that every student regardless of socioeconomic status, ethnicity, past history, and academic background should have access to opportunities for success socially and academically in our unique whole school magnet program. We have an obligation to provide the support necessary for every student to succeed. We believe… "Every Student, Whatever it Takes!"

The principal's vision and mission for the school is epitomized in a saying that all teachers have embraced, "Every student, whatever it takes!" The school culture is to do whatever it takes to help students succeed.

School improvement plans are generated using root cause analysis and a close examination of student data. In recent years, the data showed large gaps in achievement by race, especially for Latino students. According to the assistant principal, data analysis revealed that only 20 percent of students taking advanced courses were Latinos. This subgroup also had the lowest grades, "Parkland had been doing well numerically … that is what our success was based on, did you pass the MSA? The numbers were glaring: 57 percent of Latino students had a D or an E in a class. When we looked at the data in science and math classes [students were] passing the test but not passing the class." In response, the school adopted culturally relevant instruction (CRI) in the 2013-14 school year. The principal framed the impact

of CRI as this: "Every time we make a decision we ask ourselves: 'How are we helping our minority population and how are we complementing their culture?'"

The 2014-15 school improvement plan focuses on three core areas: 1) adapting and aligning instruction to the Maryland College and Career-Ready Standards, 2) social emotional learning objectives, and 3) the implementation of professional development related to culturally relevant instruction. Work in the area of the state standards includes implementing professional development on how to develop rigorous content and engaging lessons, using data to inform needed to adapt instruction, and analyzing teacher observation data for evidence of student engagement. Four social emotional learning objectives (SELO) have also been established, for example, valuing and respecting diversity and differences or building resiliency. Students develop their own SELO objectives aligned to these broader ones. Essentially students are given a prompt such as "what can you do this year to have respect diversity and differences? How can you learn about a different culture?" and write an SELO objective in response such as "I am going to meet someone this year that is different from my race and culture."

Applied broadly, these strategies have focused the school on using data to make instructional decisions and identifying the kinds of supports that students need. It has resulted in streamlining the number of interventions used in the school. Before the move to CRI, the school had, "Lots of interventions for students, before-school, after-school, reading, math interventions during the day…which helped our neediest students…[but we] realized that in that process we were focusing on a small portion of our population." They purposefully switched from a heavy focus on intervention to talking about what was happening in the classroom on a daily basis. Professional development is focused on data analysis, how students perform in the classroom, identifying students' strengths and needs, and supporting student learning.

Beyond the use of CRI, the school is in the process of adopting instructional methods – Universal Design for Learning – designed to boost student engagement. The school also uses PBIS to encourage and reward positive behavior. Taken together, these programs encourage school leaders and staff to be reflective about their own practices and intentional about trying new strategies.

School Schedule

The school day begins at 7:55 a.m. with an 11-minute homeroom period. The first bell of the day sounds at 7:45 a.m. – the warning bell – to ensure students enter class on time. The instructional day is six hours and 30 minutes, running from 8:10 a.m. to 2:40 p.m. The length of the lunch period is 30 minutes on average. All in all, students receive six hours of instruction daily.

Parkland has four periods a day, but uses a block schedule with 84-minute periods that alternate every other day.

In other words, the school has eight total periods that are divided into blocks of four periods that alternate daily:

Day One	Period 1	Period 3	Period 5	Period 7
Day Two	Period 2	Period 4	Period 6	Period 8

Educators teach either two or three 84-minute periods per day depending on their schedule. On an odd day a teacher might teach three periods (for a total of 4.2 hours) and have one period free for collaborative professional development. On even days a teacher might teach only two periods (for a total of 2.8 hours) and have one 84-minute period free for individual planning and one 84-minute period free for an instructionally related activity (IRA). IRA's includes working with colleagues on school leadership/parent activities, or supporting the school's multicultural initiatives or even on social emotional learning.

Curriculum and Instructional Program

Instructional Models

The school's leaders and teachers placed a strong emphasis on the role of culturally relevant instruction in pushing student achievement. CRI has been described as a method of exploring "ways that teaching can better match the home and community cultures of students of color who have previously not had academic success in schools (p. 466)."[41]

At Parkland, CRI has been used as a vehicle for administrators and staff to examine their own cultural biases and develop an understanding of how "abilities, ideals, and experiences of color effect the students you are teaching." Some members of the school participated in a study circles group, which was a two-day retreat designed to help people understand other's perspectives. Implementation began in the 2012-13 school year with the school's leadership team and in 2014-15 became the focus of activities and work conducted during teachers' professional development time.

CRI also encourages teachers to integrate ideas and materials that reflect students' culture into their lessons. The staff development teacher provides teachers with strategies on how to integrate CRI aligned practices into their classrooms. As the principal said, teachers at Parkland have always been interested in knowing where their students were coming from (culturally, socioeconomically) and developing trusting relationships. CRI builds on this by having teachers reflect on how their own expectations and biases might influence student performance.

Another initiative being implemented at Parkland is Universal Design for Learning (UDL), which comes out of the district's High Incident Accessible Technology (HIAT) office. As described by school staff, "UDL

[41] Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal, 32,* 465-491.

is process for teaching the students…giving them choices on how they learn, what they learn and how they show that they have learned."

Implementation of UDL began in 2013 with eight to 10 teachers getting training and course work for the full year. It was implemented school-wide in 2014. To make sure the staff does not feel overwhelmed, UDL will be introduced over a two-year period and teachers are encouraged to take "baby steps," that is, to incorporate one new UDL strategy into their instruction each semester.

UDL was a good fit for Parkland because it addresses student achievement and engagement. "In years past we just made kids stay after-school and do, do, do more work […] but now we try to get more kids engaged during class […] Interventions did a great job [but] only took us so far […] [UDL gives] kids an opportunity to show school is fun." Moreover, the program encourages students to be reflective about their decisions in order to help them identify the best ways for them to learn. For example, students could choose to do a skit rather than write a paper to demonstrate their understanding of a topic and at the end of the project they would be asked to reflect on whether it was a good choice and how much they learned.

UDL looks very different within each content area and across all teachers. One teacher noted that she gives students different ways to access the content (video, online, textbook, lecturing with teacher, working with other kids) and demonstrate their learning (e.g. Podcasts or Prezi).

The link between UDL and CRI was also emphasized, "Some kids come from a culture where group learning is a better way to learn than individual. [CRI and UDL are] not mutually exclusive. [They] work hand in hand to meet the needs of every student in the building."

Curriculum

Reading

Parkland offers reading courses in every grade (e.g. Reading 6, Reading 7, and Reading 8) that utilize a district-developed curriculum. These are not popular courses, according to the principal, and students often ask him, "Can you get me out of reading?" Students who read above grade-level (as measured by MAP-R) do not have to take the school's reading class and instead can choose to either take world language or a science elective.

Parkland uses the Read 180 program to support students who enter the school reading below grade-level. The program is geared towards grade six students, but there are also a few sections offered to grades eight and seven students.

Read 180 utilizes three main components: 1) whole group instruction, 2) three station-rotations between instructional technology, independent reading and small group, and 3) whole group instruction (5-10 minutes).

This program also provides support for students who read on or about on grade-level, but who are struggling in content area classes. Some of the skills emphasized are how to make meaning from text and writing strategies (e.g. thesis and claim statements). Teachers described the role of the program as being "to help [students] get skills they need to show learning in other content area classes."

Teachers also mentioned a new curriculum called "Digital Literacy," which is a self-paced and self-guided curriculum. "Students are given the opportunity to choose an area of study, and they find the text, they learn it, they read it and they present it at the end. The reading teacher becomes a true facilitator of learning…"

Math

The school relies on the district's math curriculum (Curriculum 2.0, which is aligned to the state standards) and uses textbooks approved by the district. No one interviewed could name a commercial math program beyond interventions such as Study Island or Khan Academy.

Math courses accommodate a range of student abilities. There are grade-level courses such as Math 6 or Math 7 and courses geared to students at risk of academic failure, such as Math Investigations. Grade eight students can take Algebra Prep, Algebra I, Honors Geometry, or Algebra II-B.

According to teachers, the district's curriculum is strategy-based and the students choose which strategy is most efficient for them. Students learn different ways to do things through technology and manipulatives. Formative assessments are used to track student performance and many teachers use daily assessments (formal or informal) to guide day-to-day instruction and determine what to re-teach.

Science

Parkland is an aerospace magnet school and thus places a heavy emphasis on science instruction. In fact, the school has 16 science teachers on staff and offers 15 science courses. Every student takes two science classes a year and has the option to take more science courses as electives. Some of the electives offered include robotics, principles of flight, astronomy and engineering (offered through Project Lead the Way). In fact, the school condenses three years of science into two years so that grade eight students can potentially take a high school level science class.

As the magnet program coordinator explained, "The middle school curriculum put out by the state had to be covered in grade seven and eight," which forced the school to develop its own program model and adjust the district's curriculum to fit within the aerospace theme. For example, biology is integrated into the course Human Space Exploration by examining what happens to the human body in space, while the course Unmanned Space Exploration integrates aspects of chemistry and physics.

Grade eight students can take Honors Physics as a one-credit high school course, but are required to take algebra as a pre-requisite. For students who do not satisfy the algebra pre-requisite, the school offers an earth science course called Investigations in Earth Space Systems. Honors Physics and Earth

Science draw directly from the district's science curriculum. Other science courses rely on commercial textbooks from Prentice Hall and resources developed by universities (for example, the Honors Physics course used simulations from the University of Colorado).

Teachers acknowledged that, "having [students take] two science classes is rigorous" especially considering that these students are coming from elementary schools where science was a small, supplemental component of the curriculum. Every year, students also must complete a milestone project in which they pose a testable question, develop an experimental design, conduct the experiment, and then analyze the data to form conclusions to prove or disprove the topic's hypothesis. The purpose of the project is to help students learn to apply scientific inquiry and to frame their education within the big picture – a practical application of what they are learning in school. The program is equally rigorous for teachers who must collaborate on developing the curriculum without support from the district.

Advanced Instruction

Students are offered advanced courses across the content areas. The school offers Advanced English, Honors Geometry, Honors Algebra II, Honors Physics, Advanced Comparative Planetology and Orbital Mechanics, Advanced Human Space Exploration, Honors Spanish, Honors French, Advanced World Studies, Advanced U.S. History, Advanced Orchestra, and Advanced Band.

Assessments

In the 2014-15 school year, Parkland made the transition from the MSA to the Partnership for Assessment of College and Career Readiness (PARCC). The PARCC is a summative assessment conducted in two parts: 1) the Performance Based Assessment (which focuses on skill application) and 2) the End-of-Year Assessment (which focuses on comprehension and understanding). Teachers viewed the test with both optimism and trepidation. As one shared, "CCSS and PARCC are truly asking kids to develop the skills they are going to need later." Another teacher offered a different take, "We run testing from January through June and PD gets shut down. What brings Parkland attention is we have good test scores, but I don't know it if improves how kids did academically in their core classes. Did it improve their critical thinking? Did it prepare them to go to college? No…unless you become creative with your scheduling as we're trying to do, it shuts down instruction."

Parkland uses MAP-R (Measures of Academic Performance of Reading) and MAP-M (Measures of Academic Performance of Math) – which are computer-based assessments administered three times a year to all students in grades three through eight in the district – to gauge whether students are on grade-level *and* their growth over the year. As the principal said, "the beauty of the MAPS tests is they are longitudinal" and allow teachers to see "where the kid went throughout the year." For example, the MAP-R looks at students' ability to comprehend, analyze, and interpret text. A student's MAP-R score is one of the data points used to determine grade-level reading placement at the beginning of the year.

Parkland also utilizes formative and summative unit assessments. Students take a total of four formative assessments and two summative assessments each quarter. Teachers develop their own formative assessments since many of Parkland's courses are designed in-house. The summative assessments are developed by the district (e.g. MCPS) and can be factored into a student's grade for the quarter. Teachers expressed some concerns about the district-developed tests, noting that it was very hard to get a good score on them and questioning the equity of these assessments. Many teachers saw more value in the in-house assessments.

The unit assessments are aligned to the state standards and reflect the transition to the next generation PARCC assessment. These tests allow students to develop the skills they are going to need later, such as pulling information from a variety of sources or analyzing texts and making claims.

Teachers acknowledged that there are a variety of ways that students can demonstrate their learning (daily summarizers, test/quizzes, and district assessments) and that they do not rely on data from one source to assess students. "[They're] all pieces of a puzzle that fit together and work together in order to get our kids to where they need to be."

Additionally, some staff commented that, "The people here are very committed to understanding the student as a whole – really trying to understand who they are as a student rather than just focusing on the data." In other words, assessments are a useful tool, but not the only thing that drives instruction.

Interventions and Supports

Parkland has multiple interventions for students at risk of academic failure or those that require additional supports. Several interventions target students who are not performing well in class (as measured by their grades) or on assessments (such as the MAP-R or MAP-M). Additional interventions target English language learners, special education students, and students with behavioral concerns. The school also provides some wraparound programs, including a family market and the Linkages to Learning program.

Interventions for students who are struggling academically include a mandatory math detention, extended learning after-school, help from teachers during lunchtime, a Latino mentoring program, and summer school:

- Students who perform poorly on a math test, fail to turn in a series of their math homework, or are earning low grades in math (Ds and Es) must attend a math detention. It is held every Friday and students are provided with support to help them catch up;
- Parkland Plus is an extended learning program offered after-school two days a week for a period of three months. It is geared towards students who are struggling in English and math (as shown on MAP-R and MAP-M assessments). As the principal shared, "We'll be all over your case if you don't go." When that program ends, students start working on algebra support;

- students can receive extra help from teachers over their lunch hour and some teachers even give their cell phone numbers to students. The only caveat is that students must ask for this help ahead of time – it's not like office hours when they can just drop in;
- low-achieving Latino students are matched with a higher achieving Latino student who provides them with tutoring help in all subject areas;
- as previously noted, the Scholar's Coordinator works with a group of 60 minority students (targeted based on their GPA) to help move their grades up. This group meets once a week after-school and students receive help with their study and test skills; and
- Parkland has the largest summer school program in the district. Summer school placement is also based on MAP-R and MAP-M test scores. The school receives a certain allocation from the District and they always fill it. Additionally, summer enrichment camps are offered in robotics, astronomy, world languages and more.

Students are eligible to exit these interventions if they "score better." The principal emphasizes that students need to show him that they are working hard to improve and that his role is to help "get [their] butt in gear." The principal leverages academic ineligibility as a motivation tactic for students, "Maintain above a 2.0 GPA now [and] then I will let you play soccer." He framed it as "wheeling and dealing" to help "put a fire" under students to perform better academically.

The primary intervention for LEP students is Saturday school, which is provided at an off-site location. The George B. Thomas Sr. Saturday School provides tutoring and mentoring in reading, language arts, and mathematics. Classes are held from 8:30 to 11 a.m. from September through May. It is marketed as providing an "extra day of instruction."

The only intervention mentioned specifically for special education students is a homework club that meets three times a week after-school.

Students whose behavior negatively impacts their academic performance are placed into the Alt 1 classroom. The program was characterized as an alternative class for "kids who've had issues." Students are placed in the Alt 1 classroom based on a variety of criteria including documented behavior issues over time (evidenced by numerous referrals to the office) with minimal improvement. They must receive a functional behavior assessment and also have a Behavioral Intervention Plan (BIP) in place. Alt 1 provides students with mentoring, help with schoolwork, and strategies they can use to improve their behavior. Students are referred out of Alt 1 when they have demonstrated improvement in their behavior and academic performance. One teacher said that the program was helping. "One kid had a lot of referrals last year and this year has had a lot less – he's doing remarkably better than last year." However, the principal also noted that some students "fall flat on their face" when they exit Alt 1 because they struggle to work independently after receiving so much support.

Beyond addressing the academic and behavioral needs of students at risk of academic failure, the school provides programs that support their families. Family market day provides families with free food

donated by the Capital Area Food Bank. Our visit to the school happened to coincide with family market day and there were several hundred people lined up to collect fresh vegetables, and canned and boxed foods. The school holds regular academic achievement nights that are designed to give parents information about how they can support their child's learning. Additionally, the school has a free breakfast program (through the state's Maryland Meals for Achievement program).

Finally, Parkland has a Linkages to Learning program, which is sponsored by the district, and provides health, mental, and social services to children and families in elementary and middle schools with the highest percentage of FRPM students. The program has its own room in the school with dedicated staff. Some of the services provided include family case management, mental health services such as therapy and diagnostic evaluations, and educational support such as adult education classes in LEP or literacy. All of the services are free, with the exception of mental health services (fees are on a sliding scale for those that lack insurance and may also be covered by Medicaid).

Collaborative Teams and Professional Development

Collaboration

The school's schedule provides teachers time during the school day to collaborate with their colleagues. This collaboration takes place in multiple ways. First, teachers are given time (84 minutes) for professional development with their content area colleagues every other day. Second, teachers also get 84 minutes to work with colleagues on instructionally relevant activities that support the school overall. For example, planning school-wide award ceremonies.

Moreover, special education inclusion classes use a co-teacher/paraprofessional model. Teachers must meet and plan collaboratively, and as the principal said, "You don't see that at a lot of schools. Sometimes co-teachers just show up and there is no room or space for common planning."

The focus on collaboration and support was reiterated by everyone interviewed: "We are like a family at this school. Not everyone sees eye to eye, but in the end we love each other and we support each other. We are going to do what we need to do to support the kids that are in our building."

The time built into the day for planning and collaboration is very intentional. Two years ago, the school leadership team acknowledged that teachers could not be forced to stay after-school to plan or collaborate. So, scheduling changes were made to facilitate collaboration. Integrating collaborative planning into the school day was accomplished by moving team meetings to after-school. Team meetings are run by team leaders. As previously discussed, team leaders are classroom teachers who are charged with organizing the entire grade-level and supporting the work of initiatives such as PBIS. Team meetings consist of talking about students, and tackling suspension or academic eligibility issues. For example, teams might discuss why there are so many students with a D or E grade before the marking period and the devise a strategy for boosting the performance of these students.

Professional Development

Professional development is conducted by content area,[42] led by the staff development teacher. Professional development is a core component of Parkland's success. Much of the content of PD currently is focused on CRI and UDL. Teachers do much of this work together, but also have individual tasks. During testing season, teachers are assigned PD projects or homework to complete related to CRI.

The research team observed the math teachers engage in a PD session geared toward examining questions of equity and whether all students are held to the same standards and expectations. It was clear that these teachers worked well together. One new teacher characterized her colleagues as incredibly caring and supportive and noted that they held high expectations for each other as well as for the kids.

One administrator characterized the amount of PD as "unusual" but necessary for supporting the school's initiatives. In previous years, PD focused on classroom management and implementing instructional strategies and practices that would increase scores on the MSA. The principal stated that there was a "heavy push on fundamentals," which meant providing more instruction on fundamental concepts within a content area. These fundamentals included, for example, fractions, decimals and percentiles in math or vocabulary instruction in English language arts. Additionally, PD was not only focused on teacher development, the time was also used for teachers to talk about specific students and identifying strategies for helping address their weaknesses. Teachers often took the summative assessments before administering them to students "so they knew what they were tested on" and what they needed to get the students to review before the semester progressed.

School Culture and Leadership

Eight years ago, when the principal arrived at Parkland, he was told, "Welcome to the war zone." The school had been losing students and had seen declines in student performance. In those early years, he sought to accomplish two things: 1) build a positive school climate and 2) hire, support, and retain good people. As he shared, "Climate and staffing determine your success."

One mechanism used to improve school climate is Positive Behavioral Intervention and Supports (PBIS), a behavioral intervention model to enhance students' academic and social behavior. PBIS is also used as a strategy to motivate students to meet behavioral expectations. These expectations include acting respectful, responsible, and ready to learn. Students are able to earn Panther Paws for use at the school store and at school bazaars (they held a winter bazaar where students were able to use Panther Paws to

[42] The science department is an exception to this model. There are 16 science teachers in the school who are split up by grade cohorts for the purposes of collaborative professional development.

buy presents for their families.) The parent teacher association provided funding for the Panther Paws, gift cards, and other small items that the students might want.

The importance of a positive school climate is also reinforced during student town hall meetings where teachers and students discuss issues related to behavior (suspensions, referrals, eligibility). Grade-level town hall meetings are held every quarter and students are provided incentives to meet certain goals. For example, if the grade has zero suspensions, students can have a class dance or an ice cream party.

One town call consisted of only African American students and focused on why they had the highest suspension rates in the school. As one staff member said, "[we] realized that town hall meetings help kids discuss what is going on in the building. For six weeks [afterwards] there wasn't a single suspension of an African American student."

The principal and staff place a lot of effort into making school a fun and positive place to be. Students are rewarded for earning good grades (a C or above) through ABC parties. These parties are held at the end of every quarter and "load[ed] up with fun" including dancing, treats, and VIP perks for students on the honor roll or with straight A's. These VIP perks include a special lounge that has pizza and ice cream and can only be accessed with a VIP wristband. The ABC party creates peer pressure for students to succeed academically for fear of missing out. On some Fridays, the school holds a power period of fun, where students get a half-hour of outdoor fun. Additionally, grade eight students who go a whole quarter without earning a suspension are rewarded with an ice cream social.

Moreover, the school emphasizes the "5 R's:" Rigor, Relevancy, Relationship Building, Routine and Resiliency. From the principal's perspective, high poverty schools need to focus on relevancy and relationship building. This includes helping students understand the connections between what they do in school and other areas of their life (relevancy) and develop positive relationships between school leaders, staff, and the students (relationship building). The focus on relationships is exemplified through the annual teacher versus student basketball game, events where the principal has had to kiss a bullfrog, or where one teacher had his head shaved in front of the students. Some staff members have gotten a pie in the face to benefit the school's charity efforts and student/teacher relationships.

The principal provides leadership opportunities for teachers and creates an environment that encourages collaboration. For example, both CRI and the UDL initiatives are led by teachers. As one administrator said, "[The principal's] leadership is important because he just lets you do stuff. He knows the strengths of each of his staff members especially the ILT [instructional leadership team] and allows us to do what we know how to do best. Doesn't say no but does ask why – what is the purpose? I can't imagine too many principals that would just let you run with it."

Additionally, the principal emphasizes relationship building. For example, every December the school administrators make breakfast for the staff. The principal also works to instill respect for each other as

colleagues. As one staff member said, "I don't know if I would still be here if I didn't work with the people I work with now…finding the people to get onboard and give our students opportunities because they go the extra mile – that's really important." Collaborative professional development has fostered a culture where teachers respect one another as professionals and can lean on each other for help.

Summary

Parkland Magnet Middle School demonstrated high (and consistent) growth in student test scores between 2007 and 2013. Interviews with staff members, the school's instructional leadership team, and the principal point to several factors that have contributed to increases in student achievement:

1. Supporting teachers. The school's large instructional and support staff, combined with adequate resources, support, and strong focus on professional development has helped increase teacher retention at the school.
2. Focus on teacher collaboration and professional development. Teachers meet for collaborative planning and professional development every other day. Moreover, they participate in Instructionally Related Activities every other day and have team meetings three times per month. Teachers' professional development is led by a staff development teacher and is focused on building their knowledge and skills in Culturally Relevant Instruction (CRI) and Universal Design for Learning (UDL).
3. Instructional models aligned with student needs. The school used root cause analysis to determine which students or learning areas required the most support. Given the large number of minority students – and persistence of the achievement gap – they are implementing two new instructional practices better aligned to student need. Culturally Relevant Instruction places emphasis on teachers' use and integration of instructional resources and materials that reflect students' cultures. Universal Design for Learning provides students with multiple ways to learn and demonstrate their learning and is a tool for boosting student engagement.
4. Multiple interventions. Parkland offers a multitude of interventions to provide students with extra support and help. After-school tutoring programs are available for struggling and special education students, and the school also runs a math detention. LEP students are required to participate in Saturday school and receive double periods of instruction. There is a Scholars Coordinator who is charged with monitoring and supporting 60 minority students to improve their academic performance. Students with behavioral issues are provided with supports and strategies in a stand-alone Alt 1 classroom. Finally, the school provides wraparound services through the Linkages to Learning program and initiatives such as family market day that provides families with free food.

5. Positive school climate. The principal and school staff have built a positive learning environment for students using a variety of motivational strategies. Students who earn good grades get to participate in an ABC party and those who are on the honor roll or earn straight A's receive VIP privileges, such as a private lounge. PBIS rewards students' positive behavior with Panther Paws that can be used to purchase items from the school store. Teachers respect one another as colleagues, and as one administrator said, "This is Parkland. This is different. It's this atmosphere, it's kind of like a party."
6. Specialized programming. Parkland is an aerospace magnet school and sets high expectations and rigor for students. Students take two science courses a year and are offered the chance to earn high school credits in grade eight. Additionally, they are afforded the opportunity to take multiple science electives in the areas of robotics, engineering, and principles of flight. The school accepts students via a lottery but does not have admissions requirements. Much of the science curriculum is crafted in-house and students view the school as a stepping-stone for getting into specialized high schools.
7. Strong leadership. The school has benefitted from continuity in leadership and the development of a shared vision. The principal has a positive outlook and places emphasis on pushing all students and teachers to reach their potential. He is purposeful in his hiring and equally purposeful in creating a positive and rewarding learning environment. Importantly, the principal trusts his leadership team and staff to "do what they do best" and "run" with initiatives or programs they believe will be beneficial for the school.

Alignment with the Evidenced-Base Model

Many of the strategies implemented by Parkland Magnet Middle School to boost student performance are aligned with the EB model. First, the school uses a root cause analysis to develop annual school improvement plans. This process relies on the examination of several data sources to get a deeper picture of student performance.

Parkland is an aerospace magnet school where teachers have had to develop much of the science curriculum on their own. Additionally, the school recently implemented the district's Curriculum 2.0, which is aligned with the state standards. Two new instructional strategies are being concurrently launched – Culturally Responsive Instruction and Universal Design for Learning – that promote greater understanding of students' background and culture, and boost student engagement. Moreover, school administrators and teachers are leading the implementation of these strategies.

Additionally, the school's instructional leadership team often engages in data-based decision making. The story behind their adoption of CRI lies with the team's realization that Latino students were underperforming compared to other students – a conclusion drawn by looking at MSA data and students' letter grades. Other data sources, such as informal class assessments, are used to identify concepts that require re-teaching. Student placement in intervention is also determined by data. Certain kids are targeted for after-school tutoring and math detention through this data analysis. Moreover,

class sizes are close to what is recommended in the model (25 students per class), but the school has more elective teachers than the model recommends due to its use of a block schedule.

Professional development is offered on a regular basis and led by the staff development teacher. The school does not have instructional coaches per se, but rather leans on the staff development teacher, team leaders, and content specialists to provide support and training to teachers. Parkland has a total of 3.4 FTE instructional coaches (e.g. staff development teacher, content specialists, and team leaders), which is one FTE less than suggested by the EB model.

The principal has placed a strong emphasis on hiring teachers who are willing to commit extra time and do what it takes to help students succeed. Hiring is a collaborative process and the principal strives to learn as much as possible about potential candidates. New teachers are provided with support from the staff development teacher and the principal endeavors to ensure that they are welcomed with open arms into the Parkland community.

Finally, multiple interventions have been implemented to support students at risk of academic failure. The school has academic interventions such as the Parkland Plus program, Saturday school for LEP students, Latino mentoring program and math detention, and the scholars program. Other interventions such as Study Island are also made available to students. Behavioral interventions include the Alt 1 classroom for students with behavior challenges and the school-wide PBIS program that sets expectations and provides incentives for positive student behavior.

Taken together, Parkland has leveraged several strategies to spur improvements in student achievement and been deliberate in its use of resources, as the principal noted, “It doesn't hurt at all to get resources, but you gotta use them!”

Chapter X: Patterson Park Public Charter School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

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Executive Summary

Patterson Park Public Charter School is an example of the third category of schools – one that saw significant academic growth among student subgroups.

Patterson Park Public Charter School (PPPCS) is located in southeast Baltimore across from a 137-acre park of the same name and about a mile from the Johns Hopkins Hospital. It is an elementary and middle school that serves students in prekindergarten through grade eight. It serves a diverse student population. The school is 58.8 percent African American, 24.2 percent Latino, 13.2 percent white, 80.4 percent of students qualify for free and reduced-price meals, and 17.5 percent are English language learners. Total enrollment is 670 students.

Between 2007 and 2012, student performance on the Maryland State Assessments (MSA) increased for all students and for all subgroups of students. On average, the percentage of all students scoring proficient or advanced increased from 53 percent in 2007 to 78 percent 2012, for a 24-percentage point change. Subgroup gains were even larger. These gains are likely related to how the school allocates resources to support the curriculum and instructional program. Among these are the following:

1. Strong curriculum and instructional program. The success at PPPCS starts with investing time and resources into developing a strong curriculum and instructional program. This program aligns with the school's goals and is interdisciplinary and thematic, with an emphasis on hands-on learning. The curriculum is designed by school staff to ensure that it challenges students at a level commensurate with their academic potential, incorporates learning tasks tied to students' interests, and supports the development of critical thinking and problem solving skills.
2. Staffing. Staffing ratios allow for small classes, access for all students to "specials" classes (electives), and sufficient time for planning and collaboration. School-wide, average class size is 23 students.
3. Collaborative planning time. Time for planning is built into the school schedule and includes both individual and collaborative planning. Collaborative planning reinforces the theme-based approach to instruction by helping teachers integrate the themes across the curriculum.
4. Investments in the hiring process. Investments in the hiring process insure that new teachers are committed to the school's vision and teaching philosophy. Applicants teach a model class and interview with a panel of teachers and administrators from the school. This investment is coupled with a mentoring program for all new teachers and teachers who are new to PPPCS.
5. Prekindergarten. Investment in and expansion of prekindergarten so students are better prepared when they enter kindergarten.
6. Differentiated instruction. An emphasis is placed on differentiated instruction based on student need. This is facilitated by performance-based assessments where students demonstrate their understanding of a concept.

7. Extra support. Multiple approaches to helping students who struggle, including after-school programs for students needing extra help, a summer school program, and additional support through special education, Title I, and LEP programs.
8. Community school. The school has invested in a community school concept that brings additional resources and partners to the school. These partners play an important academic role in providing theme-based field trips that connect to what the students are learning in class. They also provide other services such as health, fitness, and social services for students and their families.

Introduction

Patterson Park Public Charter School (PPPCS) is located in southeast Baltimore across from a 137-acre park of the same name and about a mile from the Johns Hopkins Hospital. Like many inner-city neighborhoods in Baltimore, Patterson Park experienced an exodus of middle and working class families as social and economic conditions changed. An effort begun in the mid-1990s to increase home ownership and reduce vacancies helped to increase home ownership and stabilize the area. The population of the neighborhood is diverse, both economically and racially.

Members of the neighborhood association, interested in finding alternatives to Baltimore City Public Schools System (BCPSS), founded PPPCS in 2005. In the first years of operation, the school struggled to meet the needs of a large and diverse student population, in part because of the range of student's needs, leadership challenges (the school was operated by a for-profit educational management company at that time), conflicts with the community and founders, and difficulties securing adequate funding and access to services from the City Schools. Academic performance at PPPCS placed the school in the lowest quartile among the city's elementary schools. The current principal was hired in 2007 and the board negotiated an early termination of the contract with the educational management company.

The school is located in three buildings. Two buildings that once housed a Catholic school that closed in 2003 were purchased from the Archdiocese of Baltimore. In 2010, PPPCS built a bridge building that connects the two other buildings. It houses the middle school, an art studio, Spanish lab, and science lab, and has an outdoor rooftop patio with a greenhouse. A local foundation guaranteed the loan for construction of the middle school and later a bond was issued that allowed the school to pay off the loan.

Patterson Park Public Charter School is an elementary and middle school that serves students in prekindergarten through grade eight. The Patterson Park Public Charter School, Inc. operates the school and The New and Charter School Advisory Board (NCSAB) provides oversight. State law governs enrollment in PPPCS and any student in the BCPSS can apply for admission. There are no formal admission requirements, but families need to apply, agree to the school's mandatory uniform policy,

and commit to volunteering 20-hours a year. When the school is oversubscribed, admissions decisions are by lottery.

Total enrollment was 670 in 2015. About 120 students (18 percent) lived outside a 1.5-mile radius of the school. In the elementary school, there were two prekindergarten classes; four kindergarten, first, and second grade classes each; and three grades three and four classes (Table 1). In the middle school, grades six through eight, there were two classes at each grade-level. The middle school was intentionally designed to serve 150 students, although enrollment exceeded that goal in 2015 and is anticipated to continue to grow. Class size, on average, is 23 for the school, and ranges from 20 to 27 depending on grade-level. Classes in the elementary grades are, on average, lower than those in the middle school. Class size has increased because mobility is low, less than five percent (according to the Maryland Report Card), and the enrollment model was based on a 10 percent mobility rate (according to personal communication with staff).

Table 1
Patterson Park Public Charter School Class Sizes, 2015

Grade-level	Class Size
Prekindergarten (2 classes)	23
Kindergarten (4 classes)	22
One (4 classes)	22
Two (4 classes)	20
Three (3 classes)	27
Four (3 classes)	24
Five (3 classes)	23
Six (2 classes)	26
Seven (2 classes)	23
Eight (2 classes)	25

Source: Personal communication with school staff.

The student population at PPPCS in the 2013-14 school year was 58.8 percent African American, 24.2 percent Latino, 13.2 percent white, and 2.8 percent two or more races (Table 10.2). At PPPCS, 80.4 percent of students qualify for FRPM compared to 89.1 percent for the BCPSS; 17.5 percent are English language learners compared to 5.6 percent for the city schools; and 11.9 percent receive special education services compared to 13.2 percent for the city schools. Enrollment at PPPCS has increased each year since it opened in 2005, growing from 312 students in 2005 to 674 in 2014 (Maryland Report Card, 2014). Some of that enrollment increase is attributable to the addition of the middle school, which opened with grade six in 2008; grades seven and eight were phased in over the next two years. Staff also noted a growing Latino population and an increase in white student enrollment. Latino enrollment

increased 45.5 percent between 2011 and 2014 and white enrollment by 58.9 percent over that same time period (Maryland Report Card, 2014).

For the purposes of this study, PPPCS was identified as a school that improved the performance of subgroups of students, specifically its minority, low-income, special education students, and students learning English. This case study examines how PPPCS achieved those increases in the percentage of students scoring proficient or above on the Maryland State Assessment (MSA). It seeks to identify strategies the school used and the resources needed to implement those strategies. It uses data collected during a site visit to the school in March 2015 and document analysis. Researchers interviewed the school leadership team (principal and assistant principal) and conducted six focus groups with 22 grade-level teachers, four elective, two special education, and two intervention teachers, the school-community coordinator, and three interns. Documents were provided by the principal or obtained from the school's website. Table 2 shows the number of students by student subgroup attending Patterson.

Table 2
Patterson Park Public Charter, Student Characteristics, 2014

Student Characteristics	PPPCS: Percentage of Student Population, 2014	BCPSS: Percentage of Student Population, 2014
Race/ethnicity		
American Indian/Alaska Native	-	0.3
Asian	-	1.0
Black/African American	58.8	83.8
Hispanic/Latino	24.2	6.2
Native Hawaiian/Pacific Islander	-	0.2
Two or more races	2.8	0.4
White	13.2	8.0
Students eligible for free or reduce-priced meals (FRPM)	80.4	89.1
Limited English Proficient (LEP) Students	17.5	5.6
Special education students	11.9	13.2

Source: Maryland Report Card (www.mdreportcard.org).
A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

The report has 11 sections: 1) school performance, 2) school staffing, 3) goals, 4) school schedule and teacher teaming, 5) curriculum and instructional program, 6) assessments, 7) extra help strategies for students at risk of academic failure, including special education services, 8) professional development, 9) school culture and leadership, 10) summary, and 11) degree of alignment between the school's strategies and the school improvement strategies embedded in the evidence-based (EB) funding model.

School Performance

Table 3 shows the composite data used to select PPPCS for a case study. The percentage of students who are proficient or advanced across all subjects (reading and math in grades three through eight and science in grades five and eight) was averaged to produce a number – percent proficient/advanced – for each year from 2007 to 2012. For 2013 and 2014, only the "All Students" results were available. During this latter two-year time period, the state's curriculum standards changed, but the test did not. Statewide test results dropped over these two years. Schools that had a drop of less than one standard deviation were given preference for selection as a case study site. The composite test scores at PPPCS dropped for these two years to 74 percent proficient in 2013 and 68 percent in 2014.

Table 3
Patterson Park Public Charter School Performance, Maryland School Assessment (MSA), 2007-2012

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	53	61	59	75	78	78	74	68
Free and Reduced-Price Meals (FRPM) Students	49	56	56	74	77	77	NA	NA
LEP Students	43	38	61	89	69	76	NA	NA
Special Education Students	20	25	43	76	74	58	NA	NA
Non-White/ Non-Asian Students	52	59	57	74	76	76	NA	NA

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

As shown in Table 3, the percent of students scoring proficient or advanced increased for all students and for all subgroups of students between 2007 and 2012. On average, the percentage of all students scoring proficient or advanced increased from 53 percent in 2007 to 78 percent 2012, for a 24-percentage point change. The gains for subgroups were larger. From 2007 to 2012, the percentage of students who scored either proficient or advanced increased:

- 28 percentage points for FRPMs students (49 percent to 77 percent);
- 33 percentage points for LEP students (43 percent to 76 percent);
- 38 percentage points for special education students (20 percent to 58 percent); and
- 24 percentage points for students whose race/ethnicity is not white or Asian (52 percent to 76 percent).

School Staffing

The transition from a charter school operated by a for-profit educational management company (EMO) to the current structure was a time of considerable turmoil. PPPCS was among the poorest performing schools in the city; there were conflicts between the community and the EMO; and difficulties securing adequate funding and access to services from the city schools. The EMO provided operational services, which included the principal and administrative staff. In the spring of 2007, the board hired the current principal. During this time, a number of staff members left, which allowed the principal to bring in new people committed to the mission of the school. Just three of the original staff remained at the school in 2015.

Teacher mobility is low. When teachers leave, it is usually because they have been promoted to another position, moved, or enrolled in graduate school. The principal and one assistant principal have been at the school for eight years and the other assistant principal has been there for seven years.

The school puts considerable resources into the hiring process. When hiring new teachers, the school screens people for their commitment to the school's vision and teaching philosophy. The interview process includes a tour of the school, and each applicant conducts a model lesson and is interviewed by a panel of teachers and administrators. PPPCS is a professional development site for students from Johns Hopkins University and St. Mary's College. In recruiting new teachers, PPPCS often hires from among these former interns. The school also recruits people informally through their network connections. The school takes a proactive approach to plan for staff transitions. For example, when a large number of staff announced that they were planning to leave, the administration provided incentives to entice the staff to stay an additional year. During the following year, the school invited a large cohort of student teachers to the school. This allowed the school an extended period of time to vet possible teachers and, when 10 teachers left in the spring of 2012, the school filled half of the positions from this pool of student teachers.

Table 4 shows the school's staff. The school has 11.5 full-time equivalent (FTE) administrative staff. The administrative staff includes positions that would normally be central office positions (i.e. executive director, business manager, etc.), but since the school is a charter, it is responsible for operations. The central office staff (5 FTE) includes the principal, two assistant principals, the school community coordinator, and volunteer coordinator. The principal is responsible for setting and meeting the school's academic program goals. As a community school, PPPCS is open from 6:30 a.m. to 8 p.m. every day of the week and provides additional resources the school would not otherwise have. The school community coordinator and volunteer coordinator staff the Family Resource Room (part of the community school concept), organize school activities, and coordinate building use and services with the school's partners. The business office (4.5 FTE) includes the executive director, business manager, technology coordinator, development coordinator, and controller. The executive director is responsible for setting and meeting fundraising, facilities, technology, and administration goals, and with the

assistance of the controller, developing the budget (PPPCS, Annual Operating and Capital Budgets, 2014-15). There are two FTE clerical staff.

Table 4
Staffing in Patterson Park Public Charter School

Category	FTE
Administration	
Principal	1.0
Assistant Principal	2.0
Executive Director	1.0
Business Manager	1.0
Clerical	2.0
Community Schools Coordinators	2.0
Technology Coordinator	1.0
Development Coordinator	1.0
Controller	0.5
Prekindergarten Program	
Licensed Teachers	2.0
Para Professionals	2.0
Main Program	
Core Teachers	27.0
"Specials" – Elective Teachers: 1.0 Music; 1.0 Art; 1.0 Physical Education; 2.0 Spanish; 0.8 Media/Librarian	5.8
Instructional Coaches: 1.0 Math, 0.6 Reading	1.6
Special Education	6.0
LEP Teachers	3.0
LEP Para Professional	1.0
Title I Teachers	2.6
Para Professional – Kindergarten	4.0
Pupil Support	
Licensed	
Guidance Counselor	1.0
Nurse	1.0
Social Worker	1.0
Behavior Specialist	1.0
Psychologist	0.8
Non-licensed	
Before and After Care Programs	8.0
Cafeteria	1.0

The school's staffing configuration allows the school to have small class sizes, ensures that all students receive instruction in all special classes (i.e. electives), facilitates individualized instruction, and provides time for teacher planning. The instructional staff includes 29 core teachers (including two

prekindergarten teachers), which translates into an average class size of 23 students. As previously noted, this varies from 19.5 in grade two to 27.3 in grade three. Core teachers include grade-level teachers in prekindergarten through grade four and subject area teachers in grades five through eight.

The school has 5.8 FTE elective or "specials" teachers who provide instruction in art (1.0 FTE), music (1.0 FTE), Spanish (2.0 FTE), physical education (1.0 FTE), and media/technology (0.8 FTE). A standard formula for determining the number of elective teachers is to have the number of elective teachers equal to 20 percent of the number of core teachers, which would equal 5.8 positions for this school (0.2 x 29). The total at PPPCS is 5.8 FTE. Students at all grade-levels have art, music, and physical education once a week, although the length of the class varies between the elementary and middle school. Elementary school students (prekindergarten through grade five) have one class period (40 minutes) a week in each of the three specials; middle school students (grades six through eight) have a 65-minute block in each special every week. In addition, students in prekindergarten through grade five attend a media class once a week (40 minutes). For Spanish, elementary students receive instruction once a week for 40 minutes while middle school students receive Spanish twice a week for 65 minutes in each class. Middle school students selecting Spanish as an elective receive an additional 65 minutes of instruction each week. The differences in the class scheduling between the elementary and middle school is related to the school's instructional approach to teaching Spanish.

Additional instructional support is provided by 6.0 FTE special education teachers, 3.0 FTE English language teachers, 2.6 FTE Title I teachers, and 1.0 FTE English language paraprofessional. To support the school's emphasis on developing the whole child, the school employs a guidance counselor (1.0 FTE), nurse (1.0 FTE), social worker (1.0 FTE), behavior specialist (1.0 FTE), and school psychologist (0.8 FTE).

The school has a full-day kindergarten program and a full-day prekindergarten program. Each prekindergarten and kindergarten classroom has both a full-time teacher and paraprofessional assigned to the class. A resource teacher pushes into each classroom four days a week to provide literacy instruction. The prekindergarten program was expanded in 2014-15, and currently serves 46 students. This provides access to prekindergarten to a large number of the school's students before they enter the regular elementary program.

In the elementary grades, students are assigned to classes so that each class has a fairly equal distribution of students who are high performing, middle performing, and have learning challenges. Classrooms are inclusive and include special education students and students learning English. In the middle school, students are tracked by their math and algebra ability. English/language arts classes in middle school tend to be homogeneous because of scheduling considerations while social studies and science are heterogeneous.

Teachers have subject matter expertise for the classes they teach. For example, in grade five, there is a reading teacher, math teacher, and science/social studies teacher. Class periods are 85 minutes, and

students rotate among the three classes. At the end of the day, there is a 30-minute period called the "coach class" where students can go to work on areas of need, homework, or projects. Classes in the middle school are also organized by subject matter. As one middle school teacher said, "every teacher is an expert in their field; they have a deep understanding of the content and that comes across in their teaching. We have a well-rounded team that makes what we do very rich."

PPPCS has been a community school since it was founded. Community schools expand the traditional educational mission of schools to include health and social services for children and families.[43] The aim is to improve students' overall well-being and life prospects, and strengthen families. PPPCS has 60 partners that provide academic, health, fitness, and social services to students, their families, and the community. For example, Audubon MD/DC provides environmental education for grades kindergarten through three, Baltimore City Community College offers adult Spanish classes, and the local branch library provides reading programs for students. There are several agencies that provide health resources, including hearing and vision screenings and on-site dental care for students. External partners are also used to enhance the arts program. Other organizations provide sports and fitness activities for students and food assistance and nutrition/health counseling for their families. The Family Resource Room, which is open from 7:30 a.m. to 3:30 p.m. Monday through Friday, is a place for parents to go to socialize, access community resources, or attend workshops and adult education classes.

Being a community school provides additional resources that the school would not otherwise have. To support the community school concept, the school raised $426,795 through grants and fundraising activities for fiscal year (FY) 2014 (PPPCS, 2013-2014 Detailed Data). The largest grants included a 21st Century grant of $212,500, two grants from the Family League totaling $103,950, and four foundation grants ranging from $10,000 to $30,000. Smaller grants ($1,000 to $5,000) came from other local foundations and organizations. These grants are above the school's per pupil allotment received from the BBPSS and account for about seven percent of the school's total budget of $6 million. Per pupil funding was $9,450 in FY 2015.

School Goals

PPPCS mission is to "provide a community-centered learning environment that values diversity and embraces a whole child approach to develop well-educated citizens." As a community school, its vision is to develop lifelong learners, healthy families, and strong neighborhoods. When the current principal came in 2007, he worked with the school staff, community, and board to redefine the goals, shifting the school away from an emphasis on test-driven instruction to a focus on an interdisciplinary, thematic, and hands-on approach to learning.

[43]Valli, L., Stefanski, A., & Jacobson, R. (2014). *School-community partnerships: A typology for guiding systemic educational reform.* College Park, MD: Maryland Equity Project, The University of Maryland.

In 2012-13, the school and community engaged in a "Review, Renew, Retool" process to evaluate and modify its goals and vision. It identified five key strategic goals designed to achieve the school's vision. These goals will be at the center of the school's activities for the next several years. They are built on the concept of developing the whole child and include an emphasis on academic learning, character development, and fostering creativity, culture and the arts through the "specials" curriculum and art integration. The instructional approach is interdisciplinary, thematic, and hands-on learning. The five strategic goals include:

- Develop a sustainable approach to enhancing specials instruction in support of the whole child;
- ensure that all students are challenged at a level commensurate with their academic potential;
- make interdisciplinary, thematic, hands-on learning part of the fabric of the instructional model at PPPCS;
- integrate a new character education program into the existing school-wide approach with an expanded focus on 21st century skills; and
- foster an atmosphere of trust.

Specific school goals change year to year, and include both external and internal goals. The external goals are articulated in the school performance plan (required by BCPSS) and reflect how PPPCS will meet district goals such as performance on the state assessment, attendance, school climate, and suspension rates. Meeting and maintaining an adequate level of performance and other criteria established by the Baltimore City Board of School Commissioners are also necessary for the school's charter renewal. The external goals for 2014-15 were:

- Eighty percent of grade three through eight students will score advanced or proficient (or the equivalent) on the 2015 PARCC;
- increase MSA Science performance of students from 56.6 percent proficient/advanced in 2014 to 66 percent in 2015;
- decrease chronic truants (as defined as students who have missed more than 20 days) from 28 to less than 20.

The internal goals reflect the school's five strategic goals and are intended to guide the instructional program for the year. These are the goals that drive curriculum and instruction in the school and are the ones the articulated by the staff. The school developed a dashboard that takes the five strategic goals outlined above and identifies strategies and activities for achieving each goal.

For 2015, the internal goals included:

- Accomplish the goals for 2015 on the PPPCS Dashboards (see below);
- commit to actions to increase civility;
- build endurance, frustration tolerance, and technology skills that are related to the PARCC; and

- apply and support new math curricula (i.e. Investigations and Engage NY).

Dashboard goals:

- Make interdisciplinary, thematic, hands-on learning a part of the fabric of the instructional model at PPPCS;
- integrate school-wide character education into existing school-wide approach within two years to have all children feel safe and demonstrate both independently and interdependently ("21st Century Skills");
- infuse creativity, culture and the arts into the curriculum, develop a sustainable approach to enhancements of specials instruction (in support of the whole child); and
- ensure that all students are challenged at a level commensurate with their academic potential.

Dashboard goals include both long- and short-term goals. For example, these include strategies for promoting critical thinking skills and learning how to apply what is learned to issues, problems, or concerns that are relevant to the student, making sure each child is challenged at a level commensurate with their academic ability, fostering creativity, providing opportunities for students to practice what they learn, providing opportunities for student collaboration and teamwork, etc.

In a nutshell, the school's goal is to develop the whole child. It organizes professional development activities and the curriculum and instruction around meeting this goal. During the site visit, teachers talked about the theme-based approach they take to instruction, the importance (and frequency) of field trips as integral to learning, and making sure that students are involved in arts integration activities.

School Schedule and Collaborative Teams

The school day begins at 7:50 a.m. with school announcements and ends at 2:40 p.m., for a 6-hour, 50-minute school day. The instructional day is 280 minutes with 45 minutes for lunch/recess. As a community school, PPPCS is open from 6:30 a.m. to 8 p.m. every day of the week. Class periods vary by grade and subject. In prekindergarten through grade two, there is an 85-minute literacy block while specials classes are 40 minutes. Subjects in grades three, four, and five are departmentalized and class periods are 80 minutes. Students rotate between reading, math, and science and social studies. The specials classes are 40 minutes. Class periods in prekindergarten through grade five vary, depending on the grade-level. There is an 85-minute literacy block in kindergarten and first grade, and some specials classes are 40 minutes. In grade five, class periods are 80 minutes, and students rotate between reading, math, science, and social studies. In the middle school, class periods are 65 minutes and classes in the upper grades are 85 minutes. Block scheduling is common in the upper grades. Classes in the middle school are also organized by subject matter and are 65 minutes, with specials classes also running 65 minutes. After-school, there is a 30-minute period called the "coach class" where students can go to work on areas of need, homework, or projects.

Planning time is built into the school schedule and for prekindergarten through grade five; it takes place when students have specials classes. This provides time during the regular school day for grade-level teams to meet and collaborate. Teachers in prekindergarten to grade five have 40-minutes each day for planning with one day a week used for collaborative planning. The middle school team (grades six, seven, and eight) has 65-minutes a day for planning. They also meet weekly during lunchtime. Because prekindergarten to grade two are assigned to self-contained classrooms, teachers collaborate with other grade-level teachers, but also engage in vertical planning so that specific grade-level content builds on the content of other grades. Grades three to eight are departmentalized, so teams meet across grade-levels. In addition, school ends early once a week and the entire staff meets for 60 minutes. Called Workshop Wednesdays, this time is for staff meetings or professional development activities. Typically, teacher teams decide their own professional development activities since needs differ by grade-level. Teachers are also encouraged to go to conferences or to visit other schools.

Field trips are integral to the school's mission and take place once a month (they are more frequent in the middle school). Organized by grade-level, field trips are theme-based and often feature one of the school's community partners. For example, the Parks and People Foundation may take a class to Patterson Park, located across the street from the school, and teach a lesson on the environment. The Baltimore Symphony OrchKids program (https://www.bsomusic.org/education-community/young-musicians/orchkids) came to the school and conducted a workshop on how to do a concert using buckets and sticks. Science-based field trips have gone to Annapolis to the Chesapeake Bay Foundation to learn about the bay. To support the arts integration model, the school hosted a 10-week artist in residence program with an artist from Wolfe Trap. Fields trips are preceded by content instruction in the regular program.

Curriculum and Instructional Program

School staff members develop their own curriculum. Staff members meet each summer to review and adjust the curriculum to accommodate changing priorities or respond to newly identified issues. The goals for the summer 2014 curriculum review included:

- Developing complete thematic units that align with Common Core standards and Next Generation Science Standards;
- developing a scope and sequence for all grade-levels that make sense both vertically and horizontally;
- adding new literature units where needed; and
- creating hands-on, interdisciplinary activities that align with the current curriculum in math, science and social studies.

When designing the curriculum, several priorities guide the staff. Questions that probe for deeper meaning and set the stage for further questioning (High-Quality Essential Questions) are included in each unit of the curriculum. Staff members strive to ensure that the curriculum is rigorous for all students, that is, it challenges students at a level commensurate with their academic potential. Each unit

is interdisciplinary, thematic, provides for hands-on learning, and incorporates learning tasks that are tied to students' interests, talents, and skill. Technology is integrated into the curriculum to support the development of creativity and innovation, critical thinking and problem solving, and to enhance communication and collaboration. To insure text variety, primary sources are used when possible. The curriculum is aligned to the state standards for math, English/language arts, and writing, the Next Generation Science Standards, and follows the adjusted content progression adapted from the Michigan Social Studies standards. Each unit incorporates at least one opportunity to integrate the visual arts, dance, music, or drama into instruction (Arts Integration). Finally, conscious of the school's motto, The City is Our Classroom, The World is Our Future, field trips are built into the curriculum as a means of connecting classroom learning to experiential learning. Since the curriculum draws from many different sources, some staff found it difficult working without a set curriculum. They also noted that it required a lot of extra time to pull materials together.

Staff talked about rewriting the curriculum so that it better met the needs of their students. For example, the grade one teachers found resources to strengthen the reading comprehension, spelling, and writing curriculum, using such things as 6 Plus One Traits (a writing curriculum), and aligning site words across grades, from prekindergarten through grade three. They also use Fountas and Pinnell Leveled Books for literacy, a system based on small group reading instruction.

Theme-based, interdisciplinary, hands-on learning drives instruction, with themes integrated across subject areas. Each grade-level decides on a theme, often based on the state's voluntary curriculum, and carries it across subject areas and into the specials classes. Teaching these themes include hands-on projects and interdisciplinary learning, and incorporate an arts integration component and often a field trip. Instruction is also collaborative, with both grade-level planning and cross grade-level planning taking place.

Reading

For prekindergarten through grade three, the school had partnered with the Philadelphia-based Children's Literacy Initiative (CLI), a data-driven instructional program, for curriculum and instructional development. The school's reading specialist was hired from CLI. She provides professional development on building teachers' literacy instructional skills and provides a variety of developmentally appropriate books for children's age and reading level influenced by her experiences with her previous employer.[44] According to the principal, the results from the CLI curricular and instructional approach were mixed. DIBLES data from the 2012-13 and 2013-14 school years showed that students in kindergarten through grade two performed at a similar level to their peers across the city. In fall 2014, more intensive reading interventions and supports were put into place and student performances began to outpace city averages. Despite these gains, teachers felt they needed more foundation support. The school is

[44] Children's Literacy Initiative website: https://www.cli.org/

considering adding McGraw-Hill's Reading Wonders to the curriculum to fill this gap. Reading instruction is small group based on a student's reading level. In prekindergarten through grade two, there are three reading groups that meet four days a week for 85-minutes each day. Groups are based on a student's reading level and are fluid so that students are reassigned as they progress. A reading resource teacher pushes into the room to teach one group, the teacher and para-professional teach the other two groups.

Inquiry-based instruction begins in grade three. The reading curriculum uses theme-based novels that include books at students' reading levels and slightly above their reading levels. The school also uses Side-by-Side, which provides research-based literacy units (grades three through six) aligned to the Common Core State Standards.

Math

For math, the school uses Investigations for the early grades and Engage NY (i.e. the New York State Curriculum) for the upper grades. The Investigations curriculum is based on three principles:

1. Students have mathematical ideas. The curriculum must support all students in developing and expanding those ideas.

2. Teachers are engaged in ongoing learning about mathematics content and about how students learn mathematics. The curriculum must support teachers in this learning.

3. Teachers collaborate with the students and curriculum materials to create the curriculum as enacted in the classroom. The curriculum must support teachers in implementing the curriculum in a way that accommodates the needs of their particular students (Investigations, https://investigations.terc.edu/overview.cfm).

Engage NY provides curricular modules and units for prekindergarten through grade eight mathematics, as well as high school algebra and geometry. The social studies and science curriculum combines materials from the Maryland Voluntary State Curriculum and the Next Generation Science Standards.

Character Education

Character education is an integral part of the school's curriculum. In spring 2013, PPPCS staff reviewed four programs and adopted the TRIBES Learning Communities. It was implemented school-wide beginning in the fall of 2014. TRIBES focuses on developing students' academic and collaboration skills and helping teachers deliver content in an active and student-centered manner. Each unit provides opportunities for student collaboration and teamwork.[45] Teachers noted that student behavior has

[45] TRIBES website: http://tribes.com/

improved: "With TRIBES, the character of students has improved. They help others more and are more courteous. They also understand that when a teacher reprimands you for doing something, it is not to get you in trouble, but to help you." In addition, a portion of Morning Meetings is devoted to "positive talk" and setting the tone for the day. According to teachers, using the same language throughout the day has helped students learn what to expect.

The school adopted the goal of increasing civility for 2014-15 because there were a number of items on the student climate survey that indicated bullying was a problem. As previously noted, teachers commented on the behavioral improvements of their students after implementing TRIBES. In addition, the traffic around the school during drop-off and pick-up times was problematic, so the school began working with the police and community to improve that situation.

Science

The elementary science curriculum is developed by teachers using materials from the Maryland Voluntary Curriculum, and instruction is driven by themes that the school develops. For kindergarten through second grade, science is integrated into reading and math blocks. There is also a 50-minute science block for kindergarten students and a separate 45-minute science block for grade three students. Science is departmentalized for grades three through five, when it is taught for 65-minutes per day. In the middle school, there is a 65-minute science block. The teachers develop the curriculum. One teacher uses the Next Generation Science Standards and has assembled materials to teach to those standards. It is worth noting that the middle school science program has a Robotics component. The school's Robotic Team was the state champion in a Robotic competition in 2014-15 and went to Kentucky for the national competition.

Advanced Instruction

To support high achieving students, strategies include an interdisciplinary thematic approach to curriculum and instruction, and differentiated instruction. In addition, staff use Primary Talent Development and Junior Great Books, and there is a Destination Imagination after-school program started in 2013-14.

Spanish Instruction

Students begin learning Spanish in prekindergarten. Instruction in the early grades focuses on exposure to the language and building a vocabulary. This includes learning words thematically, such as the names of the planets in the solar system, describing animals, learning colors, and simple verbs. Learning is thematic so that the themes tie into what students are learning in other classes. For example, when students are learning about the solar system, they will learn the names of the planets in Spanish. Conversational Spanish begins in grade five. Middle school Spanish is similar to high school Spanish, but takes longer to teach because the class time is less frequent. In addition, the Spanish teacher started teaching a language arts class in Spanish for Spanish speakers. The school had observed differences in MSA scores between students learning English and non-English learners. According to the teacher,

teaching language arts in Spanish helped students see the connections between Spanish and English, and led to improved test scores and helped them move out of LEP. There is also a biannual trip to Spain for middle school students. This is coupled with "virtual" trips to Spain throughout the year where students explore Spanish cities, museums, and other points of interest.

Assessments

PPPCS pays attention to scores on the state test, the Maryland State Assessments (MSA) in past years, and will use the PARCC results in future years since performance on state tests is tied to renewal of the charter contract. Other tests that are used to inform instruction include the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and NWEA Measures of Academic Progress (MAP). DIBELS is diagnostic tool used in the early grades. MAP, administrated in the fall and spring, provides longitudinal data on student performance and is useful for examining trends over time.

For the most part, the school uses performance-based assessments where students demonstrate their understanding of a concept. The emphasis is on building portfolios and providing feedback to students. These practices depend on a teacher's knowledge of what a child is learning. One teacher commented: "We are not using the city's benchmarks. We look for ways that a student can show they understand something." Another said, "We do not use standardized tests." This teacher used a daily rubric to assess whether the student met the objective for the day. A math teacher said, "In math we have tasks that they need to do. We do not stick to a particular test or quiz. If they can show in any way that they can do it, okay – they don't have to take a test. We make sure they can perform the task but it doesn't have to be in context of taking a test."

Assessments are often built into instruction. For example, the Children's Literacy Initiative includes strategies for taking inventories, observing reading and writing behavior, studying writing samples, and listening to student talk to understand how a child is learning. It also includes a process for using data to inform instructional decisions.[46]

At PPPCS, teachers know what students are learning based on their observations and the performance of their students on tasks, projects, and other observable measures. Teachers provide differentiated instruction based on student need.

Extra Help Strategies for Students at Risk of Academic Failure

PPPCS uses multiple approaches to help students who may struggle. One part of the strategy is to provide a sound foundation early in a child's educational career. To advance that goal, the school added prekindergarten in 2011 and doubled the prekindergarten enrollment in 2013. There are literacy blocks in kindergarten and grade one and a reading intervention teacher who pushes the classroom to provide

[46] Children's Literacy Initiative website: https://www.cli.org/

literacy instruction. There is an ABC crew, consisting of parent volunteers, who pull students out of class to help them with sight words and phonics.

There are two after-school programs for students needing extra help. In the elementary grades, there is the PASS program, and for middle school students, there is CREATE. Students are identified based on their literacy scores on DIBLES or MAP. Teachers, the principal and assistant principals develop a plan to address each student's needs. In addition to academic help, the after-school program includes the Fitness, Fun, & Games program and a number of clubs. Many of these activities and clubs are through collaboration with the school's community partners. Some activities are held on weekends. For example, Fitness, Fun, & Games is a non-profit organization that provides programming for children ages two to 18 designed to support cognitive, physical, social and emotional development during the out-of-school hours.[47] According to the principal, more than 350 students participate in the after-school programs.

There is also a summer school program at PPPCS. Since PPPCS students are not eligible to participate in the BCPSS summer school program unless they pay, the school developed its own program that depends on finding funding and community support. Programming varies year to year, depending on funding. For summer 2015, the Fitness, Fun, & Games program offers daily reading and math academic enrichment, fitness, arts and crafts, science, swimming and weekly field trips. There is also the SuperKids Camp for grade one, two, and three students. This program is through the Parks & Peoples Foundation[48] and is focused on building academic skills and providing a range of enrichment activities. In the past, summer programming included a kindergarten readiness camp, and a science and social studies camp for grades four through eight. Finally, PPPCS offers free breakfast and lunch for all students during the summer.

The school provides additional support to students through its special education, Title I, and LRP programs. In 2013-14, the school increased resources to support additional special education and instructional support teachers. To support special education students, teachers use Response to Instruction (RTI) and Universal Design for Learning (UDL). The Title I program provides small group instruction by subject areas for low-performing students. Title I is push-in/pull-out depending on student need. Title I teachers work with students who are not on grade-level or have difficulty mastering a certain skill. Student progress is monitored daily by the Title I teacher and reviewed weekly in team meetings (Title I teacher and grade-level teacher) and during monthly data meetings with the Title I teachers, grade-level teams, and instructional support teachers. Finally, PPPCS has an LEP program for students learning English. In addition, the Spanish teacher teaches language arts in Spanish to Spanish speaking students, which facilitates learning English.

[47] Fun, Fitness, & Games website: http://www.fitnessfunandgames.org/
[48] website: http://www.parksandpeople.org/learn/summer-programs/superkids-camp/

Professional Development

According to the principal and most teachers, professional development is ongoing at PPPCS. It takes place during the teachers' collaborative meeting time and during Workshop Wednesday, the weekly after-school meeting with all staff. Once a month, Workshop Wednesday includes professional development on specific issues and topics. Topics are often decided on by grade-level since each grade has different needs and priorities. The collaborative team meetings keep teachers aware of content taught in other classrooms and are a means to share information on working with particular students. Workshop Wednesdays also provide time for teaches to collaborate, especially with the specials teachers. When the school implements a new program, such as TRIBES, the entire staff is trained on how to implement it. Staff members are also encouraged to go to conferences and visit other schools to learn what they are doing. New teachers (both new to teaching and new to PPPCS) complete a site developed training program supported by BCPSS and are mentored by PPPCS teachers. Mentoring groups meet once a month. Finally, the assistant principals observe classrooms and provide feedback on a regular basis (there are two formal observations a year) or when asked by a teacher. Teachers commented that these observations were useful in helping them improve their practice or to deal with particular issues they may have in the classroom.

School Culture and Leadership

Teachers described the school culture as both collaborative and challenging. One teacher said, "It's a blast to work here. There is lots of independence and the administration is open to new ideas . . . We get to do the projects we want to do. Collaboration is phenomenal." Many teachers commented on the support they receive from the administration, including both support in addressing issues a teacher may have and in providing the resources they need to do their job. There is a climate of trust at the school where teachers feel comfortable discussing issues with the administration.

Teachers have incorporated the school's mission into their teaching. They take seriously the charge to educate the whole child and work hard to develop lessons that are interdisciplinary, theme-based, and hands-on. Yet there are also challenges. As one teacher said, "It's a good school trying to do a lot for kids." This means that teachers work hard, but they do so because they have the support of the administration and the time to collaborate with other teachers.

The leadership is very supportive of teachers and dedicated to providing the type of curriculum and instruction they believe will benefit the children in their school. This is evident from the inclusion of the community school to the incorporation of field trips into the curriculum and their continuing search for good practices, programs, and curricula that will help the school meet its goals. As one administrator said, "I need people to do interdisciplinary, thematic instruction here, to do TRIBES, rather than boilerplate good practices which are coming from the city."

Summary

Patterson Park Public Charter School (PPPCS) is an elementary and middle school that serves students in prekindergarten through grade eight. Between 2007 and 2012, the percentage of students scoring

proficient or advanced on the Maryland State Assessment increased for all students and for all subgroups of students. Contributing to these gains is likely related to how the school allocates resources to support the school's curriculum and instructional program. Among these are the following:

1. Strong curriculum and instructional program. The success at PPPCS starts with investing time and resources into developing a strong curriculum and instructional program. This program aligns with the school's goal to "provide a community-centered learning environment that values diversity and embraces a whole child approach to develop well-educated citizens." The curriculum and instructional program at PPPCS is interdisciplinary and thematic, with an emphasis on hands-on learning. It includes a character education component, a focus on integrating the arts into the curriculum, and the frequent use of field trips. The curriculum is designed by school staff to ensure that it challenges students at a level commensurate with their academic potential, incorporates learning tasks tied to students' interests, and supports the development of critical thinking and problem solving skills.
2. Staffing. Staffing ratios that allow for small classes, access for all students to "specials" classes (electives), and sufficient time for planning and collaboration. School-wide, average class size is 23 students. The small classes and the availability of instructional support staff facilitate individualized instruction, particularly in the early grades (kindergarten through three). A full cadre of specials teachers means that students in all grades receive instruction in art, music, Spanish, media (elementary only), and physical education. Since teaching is theme-based, the specials classes reinforce instruction received in the core classes.
3. Collaborative planning time. Time for planning is built into the school schedule and includes both individual and collaborative planning. Collaborative planning reinforces the theme-based approach to instruction by helping teachers integrate the themes across the curriculum.
4. Investments in the hiring process. The school invests in the hiring process to ensure that new teachers are committed to the school's vision and teaching philosophy. Applicants teach a model class and interview with a panel of teachers and administrators from the school. This investment is coupled with a mentoring program for all new teachers and teachers who are new to PPPCS.
5. Prekindergarten. The school invests in an expanded the prekindergarten program so students are better prepared when they enter kindergarten.
6. Differentiated instruction. School staff place an emphasis on differentiated instruction based on student needs. This is facilitated by performance-based assessments where students demonstrate their understanding of concepts.
7. Extra support. Multiple approaches to helping students who struggle, including after-school programs for students needing extra help, a summer school program, and additional support through special education, Title I, and LEP programs.

8. Community school. The school invests in a community school concept that brings additional resources and partners to the school. These partners play an important academic role in providing theme-based field trips that connect to what the students are learning in class. They also provide other services such as health, fitness, and social services for students and their families.

Alignment with the EB Model

The strategies at PPPCS are aligned with the school improvement system embedded within the evidence-based (EB) model. Those strategies that parallel those of the EB model include:

- School goals focused on developing the whole child, fostering creativity, and developing critical thinking and problem-solving skills;
- a curriculum and instruction program that aligns with the school's goals and includes a strong interdisciplinary, theme-based approach to instruction, and incorporates hands-on learning;
- an emphasis on differentiated instruction based on student need that is facilitated by performance-based assessments where students demonstrate their understanding of a concept;
- small class sizes, particularly in the early grades;
- the use of block scheduling in the middle school for core subjects, and in the early grades for literacy instruction;
- sufficient time for collaborative planning and professional development;
- extra help strategies for students who struggle with reading. As a community school, the school also provides a range of out-of-school programs designed to support the cognitive, physical, and social and emotional development of students; and
- strong instructional leadership provided by the principal and two assistant principals with additional instructional coaching provided by other teachers.

Patterson Park Public Charter School may function differently than other public schools because it is a charter school. It may have more flexibility to depart from the test-based accountability model now dominant among public schools, particularly those serving inner city students. Indeed, this was the case as evidenced by how it differentiated its external goals – those focused on achieving a certain proficiency rate on state assessments, a necessity for its charter renewal – from its internal goals – those that guided the instructional program. Indeed, teachers relied on classroom-based performance assessments more so than benchmark or standardized tests to guide instruction. This is not to say that the school leadership and teachers were not aware of standardized test scores, but they were not used to guide day-to-day instruction. Finally, the school engages with multiple partners to enhance its curriculum program, which includes a focus on arts integration and the extensive use of field trips. Indeed, the extensive incorporation of field trips into the curriculum sets it apart from many other schools.

In other regards, PPPCS aligns with the evidence-based model in how it allocates resources to support the school's goals and how it uses time to facilitate collaboration. Its staffing ratio supports small classes; provides sufficient additional instructional teachers to support all students, but particularly students at risk of academic failure; and includes "specials" teachers so that all students have access to elective classes that support and supplement instruction they receive in their core classes.

Chapter XI: Redland Middle School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Submitted by
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MARYLAND
EQUITY PROJECT
ADVANCING EDUCATIONAL OPPORTUNITIES

Executive Summary

Redland Middle School is an example of the fourth category of schools – a school that has significantly reduced the achievement gap between low-income students and their more affluent peers.

Redland Middle School is located in the Rockville area of Montgomery County Public Schools. The school has a diverse student population – 34 percent are Hispanic, 17 percent are African American, 11 percent are Asian, and 33 percent are white. Forty percent of the school's students are eligible for the federal free and reduced-price meals (FRPM) program.

Between 2007 and 2012, Redland saw large gains in student achievement on the Maryland State Assessment (MSA), particularly for low-income students. During this period the proficiency rates of FRPM eligible students rose by 24 percentage points from 46 to 70 percent, and there was a decrease in the poverty achievement gap at the school.

Interviews with staff members and the current and former principals point to several factors that have contributed to these increases in student achievement:

1. Data-driven school improvement initiatives. Root cause analysis is used to determine school goals and set the focus for School Improvement Plans (SIP). The process allows the school leadership team to drill down and set targeted (and achievable) goals that focus on specific groups of students for the benefit of the whole school. In the words of one teacher, "What is good for one is good for all."
2. Focus on school climate. Several initiatives have been implemented to foster a positive school climate. Positive Behavioral Interventions and Supports (PBIS) provide students with rewards for positive behavior but also facilitate the creation of school-wide expectations and the use of a common language. Student town halls are held every quarter so that school staff and leadership can hear student perspectives on what is happening. Students are also rewarded for strong academic performance via honor roll celebrations and the "Top Dog" award.
3. Multiple interventions. The school has multiple academic interventions such as after-school tutoring, Saturday school, and extended-day programs. An advisory period is used to foster relationships between teachers and students, and to deliver small group instruction. Behavioral interventions include the Alt 1 classroom for students with behavior and other challenges and the school-wide PBIS program that sets expectations and provides incentives for positive student behavior.
4. Teacher support and professional development. Teachers meet for collaborative planning twice a week and for team meetings twice a week. Professional development is held every Monday. Teachers' professional development is led by the staff development teacher and English language teacher development coach, and focuses on providing strategies for implementing instructional practices aligned with the school improvement plan.

Introduction

Redland Middle School is located in Rockville, a city located in the Montgomery County Public Schools district. The community is racially and socioeconomically diverse. In fall 2014, Redland enrolled 545 students in grades six to eight. Overall, core class sizes averaged 27 students, with the following average class sizes by grade-level and subject as shown in Table 1:[49]

Table 1
Redland Middle School Class Sizes

Grade-level and Subject	Class Size
Grade Six	
English	25
Math	27
Science	29
Grade Seven	
English	27
Math	21
Science	32
Grade Eight	
English	26
Math	30
Science	26

Redland is located in a community that includes "some multi-million [dollar] homes, to town homes, to subsidized homes, [and] some apartment complexes," as described by the school's former principal. The community has changed over time as has the enrollment at the school. In 2002, enrollment peaked at 945 students and declined to 507 students by 2013 (which is below the school's capacity of 735 students). Those numbers inched up to 545 in the 2014-15 school year and enrollment is projected to increase to 700 by the 2019-2020 school year.

The student body is 34 percent Hispanic, 11 percent Asian, 17 percent African American, and 33 percent white. The demographics have changed in recent years as more Hispanic families have moved into the area. One teacher noted that during his tenure the school had gone from predominantly white to predominantly Latino.

Forty percent of students qualify for FRPM, compared to the average of 34 percent in the district's other middle schools. Eleven percent of students have limited English proficiency. The percentage of LEP

[49] These are the averages for grade-level courses and do not include honors or advanced sections.

students doubled between 2011 and 2012, and is slightly higher than the district rate of nine percent.[50] Ten percent of students receive special education services, which is lower than the district rate of 11 percent. Table 2 shows the number of students by student subgroup attending Redland Middle School.

Table 2
Redland Middle School Student Characteristics

Student Characteristics	Percentage of Redland Student Population
Race/Ethnicity	
American Indian/Alaska Native	-
Asian	11
Black/African American	17
Hispanic/Latino	34
Native Hawaiian/Pacific Islander	-
White	33
Two or more races	6
Eligible for free or reduced-price meals (FRPM)	40
Limited English Proficient (LEP)	11
Special education students	11

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.

In the fall of 2014, Redland underwent a change in school leadership. The former principal who had led the school since 2008 departed at the end of the 2013-14 school year. The current principal was in his second year at the school at the time of the site visit. He joined the school in the fall of 2013 as part of the district's principal intern program. That program prepares assistant principals to become principals. The data used to document gains in student achievement correspond to the former principal's tenure at Redland.

Starting in 2007, Redland Middle School made consistent progress in closing the achievement gap between high-poverty and lower-poverty students.

This case investigates how Redland achieved the reductions in poverty achievement gaps. The report has 11 sections: 1) school performance, 2) school staffing, 3) goals, 4) school schedule, 5) curriculum and

[50] The district rates presented are for middle schools only.

instructional program, 6) assessments, 7) interventions and supports, 8) collaborative teams and professional development, 9) school culture and leadership, 10) summary, and 11) degree of alignment between the school's strategies and the school improvement strategies embedded in the evidence-based (EB) funding model.

School Performance

Table 3 shows the composite data used to select Redland Middle School as a case study site. The percentage of students who are proficient or advanced across all subjects (reading and math in grades six through eight, and science in grade eight) was averaged to produce a number – percent proficient/ advanced – for each year from 2007 to 2012. For 2013 and 2014, only the "All Students" scores were available.

Table 3
Redland Middle School Performance, Maryland School Assessment (MSA), 2007-2012

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	MSA 2007	MSA 2008	MSA 2009	MSA 2010	MSA 2011	MSA 2012	MSA* 2013	MSA* 2014
All Students	72	73	78	79	79	81	79	78
Free and Reduce-Priced Meals (FRPM) Students	46	52	59	60	65	70	NA	NA
Limited English Proficient (LEP) Students	39	38	54	39	42	38	NA	NA
Special Education Students	29	38	51	50	54	56	NA	NA
Non-White/ Non-Asian Students	50	57	63	64	67	70	NA	NA

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.

During the latter two-year time period, the state's curriculum standards changed, but the test did not. Statewide test score results dropped over these two years. Schools that had a drop of less than one standard deviation were given preference for selection as a case study site. Redland's composite test scores dropped slightly in 2013 to 79 percent and again in 2014 to 78 percent.

The data demonstrate the growth that has taken place over the past several years. In particular, the MSA scores of students eligible for FRPM increased by 24 percentage points between 2007 and 2012. Similar gains were made for non-white/non-Asian students (20 percentage points) and even larger gains were made in the test scores of special education students (27 percentage points). These statistics are notable given the persistently large academic achievement gaps often seen for these subgroups.

This case attempts to tell the story of how Redland produced these improvements in student performance. It draws on interviews with the school's current and former principals, classroom teachers, other school administrators, and support staff. Documents, such as the school schedule and school improvement plan were provided by the principal and supplemented with materials available on the school website and the Maryland State Report Card website.

School Staffing

The principal is in his second year leading the school. He joined the school in the fall of 2013 as part of the district's principal intern program. That program prepares assistant principals to become principals. The former principal led the school from 2008 to 2013 and is now at a different school.

During the 2008-2009 school year, a number of staff members left the school. An exact number was not specified, nor was the reason for their departures. Since then teacher attrition has been about five to seven percent a year.

Table 4 shows the school's staff by full-time equivalent (FTE) position. Redland's administration includes a principal, an assistant principal, and an assistant school administrator. Additionally, the school's clerical staff includes three school secretaries, a data analyst, and one financial assistant. Support staff includes food service workers, a part-time lunch aid, a security assistant and several building services personnel.

Table 4
Staffing at Redland Middle School

Category	FTE
Administration	
Principal	1.0
Assistant Principal	1.0
Assistant School Administrator	1.0
Clerical/Support Staff	
School Secretaries	3.0
School Financial Specialist	1.0
Instructional Data Analyst	0.75
Security Assistant	1.0
Lunch Hour Aide	0.5
Food Services	2.625
Building Services	6.0
Main Program	
Core Teachers	19.9
Elective Teachers	7.5
Instructional Coaches	3.2
Compacted Instruction	0.4
LEP Teachers	1.06
Alternative Program Teacher	0.8
Special Education Teachers	3.8
Special Education Resource Teachers	2.0
Educational Assistants	
Paraprofessional	0.375
Paraprofessional Special Education	3.5
Media Assistant	0.5
Lunch Hour Aide	0.5
Pupil Support	
Counselors	2.0
Nurse	1.0
Health Room Tech	1.0
Speech Pathologist	0.6
Media Specialist	1.0
Reading Specialist	1.0
Math Focus Teacher	1.0
Academic Intervention Teacher	0.6

The staffing arrangement highlights not only the core teaching positions, but illustrates the role that teacher leaders and specialists play in supporting student learning. Table 4 shows that the school has 19.9 core teacher positions for 545 students in grades six through eight for an average class size of 27.4 students. Class sizes at Redland are larger on average than the 25-to-1 ratio recommended in the EB model.

Core teachers provide instruction in the areas of English, language arts, math, science, and social studies. Redland has seven content specialists who serve as both department heads and classroom teachers (they teach one less period than their colleagues). Content specialists have several roles including working with teachers to implement instructional programs and conducting informal and formal observations of teachers to provide them with feedback and coaching. Redland also has three team leaders (one for each grade-level) who coordinate the grade-level instructional program, analyze grade-level and student performance data to monitor progress towards reaching school improvement goals, and serve as classroom teachers.

A standard formula for determining the number of elective teachers, for a school with a seven-period schedule with teachers providing instruction for five periods, is to have the number of elective teachers equal to 40 percent of the number of core teachers, which would equal 7.96 positions for this school (0.4 x 19.9). The total at Redland is 7.5 FTE, which is just below what is needed to support its seven-period schedule.

The school has several teachers who provide instruction and support to special education students and to other students requiring extra support. There are self-contained special education classes that include 10 to 12 students. The school offers inclusion classes with co-teachers and paraprofessionals. A mixed-grade resource class is available for students with Individualized Education Plans (IEP). There are two teachers (0.8 FTE total) who work in the school's Alt 1 classes, which are targeted for students with behavior issues.

There is one reading specialist at Redland who works with teachers to integrate reading strategies into their course instruction. Additionally, the reading specialist helps teachers plan lessons, co-teaches, and provides some small group instruction. The math focus teacher supports the school's algebra courses. Specifically, she works with a group of 17 students from all four sections of algebra who require support strengthening or mastering the pre-requisite skills necessary in the course (such as solving one- and-two step equations and operations with integers). She also teaches a compacted math course for advanced grades four and five students who come to Redland for the class. Compacted instruction provides these students with accelerated math courses that condense the content (the content of six marking periods is condensed into four marking periods).

There is one fully designated[51] LEP teacher for the school's 51 LEP students. Students classified at LEP levels 1 and 2 receive a double period of LEP instruction. Students in LEP levels 3 to 5 receive one period of instruction. These courses are offered instead of a traditional English/language arts course and as such focus on developing students skills in reading, writing, speaking, and listening. For example, students learn about text structure, practice writing essays, and conducting research.

The English language teacher development coach currently co-teaches reading and math and provides some professional development for teachers. The school's staff development teacher is in charge of providing professional development for teachers. In addition, she teaches a math course (she is math certified) and provides additional instructional support to teachers. As one person framed it, "[She] is modeling what she is teaching to the staff. Practicing what she is preaching."

Redland has two counselors who are charged with providing counseling services, running student groups, providing case management of students with a 504 plan, and referrals to other services and support. Additionally, the school has a speech pathologist, one nurse, and one health room tech (both of whom are not paid out of the school's budget).

School Goals

The school's goals over the past four to five years (approximately 2009-2014) have been geared towards closing the achievement gap between minority and non-minority students. Redland administrators and staff have implemented numerous interventions, programs, and supports to help boost the achievement of minority students. These interventions are expanded upon in a later section, but broadly have included behavior and school climate initiatives (e.g. Positive Behavioral Intervention and Supports), extended learning opportunities, and using programs such as Read 180 to support struggling readers.

The school's goal for the 2014-15 school year is to "increase the percentage of students on the honor roll to reflect the demographics of our student body." In other words, to increase the number of minority students making honor roll each quarter. Redland's school goals and school improvement plan are developed using root cause analysis, which as one staff member said, is a "very tedious process [where you] go through and ask questions to drill down and see where it is that your students need to be shored up."

[51] The ELL content specialist provides .26 FTE support, so is not included as being fully designated as an ELL teacher.

The principal leads the development of school goals and improvement plans with the support of the school's leadership team.[52] The root cause analysis process begins with identifying trends in the data. Next the school leadership team decides how to achieve a goal or address the issues identified in the data. Finally, the plan is presented to staff members, who are able to provide feedback and input.

The use of root cause analysis began about six years ago (approximately 2008) and was a process advocated by the district. Redland's method and process of root cause analysis was developed and refined under the former principal. Emphasis is placed on separating factors school staff can and cannot control and focusing on the areas that they can control. "The process forced staff to stop focusing on blaming outside causes for student failure…we don't spend time complaining about things that we can't control…shift has become what can we do?" Poverty was cited as an example of something that school staff cannot control.

The former principal helped drive changes to the school improvement plan (SIP). Over time, it become a much more focused document. As the former principal said:

> "The turning point for me [was] looking around our media center and there were all these huge posters [with] 75-80 different action steps and looking at all the red and yellow dots – things that weren't in place. One of the parents was joking with me [and said], 'I don't know how you manage all of this.' But she was right, we didn't."

As a result, the leadership team began the SIP process by identifying a group of students who needed the most support, and developing strategies that could not only benefit these students, but the whole school. For example, the implementation of Positive Behavioral Intervention and Supports (PBIS) to improve the school climate provided students with set of consistent expectations around behavior, and teachers with common language to use when teaching these expectations. Additionally, focus was placed on improving instruction/improving performance in one or two subjects. In the words of the former principal, "We would start early…looking at the data, what are the root causes…. vetting data over and over again to dwindle it down. Really taking the SIP process and refining it every year, going from a very broad (almost feel good kind of thing) and taking it down and naming kids and naming groups."

The 2014-15 school improvement plan reflects this focus on refinement and use of root cause analysis. Data from the root cause analysis conducted for the 2013-14 school year led to a focus on academic language, "particularly [in] writing. All students participate in social media, but that writing is not what you need to be successful," noted one teacher. Redland's SIP states that "our students need daily

[52] The school leadership team includes content specialists, team leaders, an administrative secretary, a media specialist, a data assistant, an AEIST (Accelerated Enriched Instruction Support Teacher), a reading specialist, and elected faculty and staff representatives.

opportunities to acquire and apply academic language strategies, which lead to effective and authentic communication through writing." School staff and administrators say that professional development is also aligned with the SIP.

One mechanism the school uses to achieve this goal is through an increased focus on academic language. Another is to use collaborative teacher time to discuss student data and specific students. A third is to hold student town hall meetings every quarter in order to solicit student perspectives on the school's progress – in other words, to keep students engaged in their own learning.

School Schedule

The instructional day is six hours and 45 minutes, running from 7:55 a.m. to 2:40 p.m. The length of the lunch period is 30 minutes. All in all, students receive five hours and 55 minutes of instruction daily. Teachers teach five periods and have two periods for planning, professional development, or team meetings.

Redland has seven 45- to 49-minute periods and one 20-minute advisory period. The advisory period consists of activities designed to develop student's social skills, organizational skills, and to help forge bonds with teachers.

Curriculum and Instructional Program

Reading

Teachers use a curriculum that was developed by the Montgomery County Public Schools (MCPS). It appears that the reading curriculum has not been updated for some time as one participant characterized it as "old as the hills." Many teachers expressed dissatisfaction with the alignment between the curriculum and the resources provided to deliver the lessons. For example, one teacher commented that they must use Google Chrome to access some of the content and found Google Chrome "very difficult" to navigate. Another stated that they use the Language of Literature book, but that the majority of the questions in the textbook "are too simple and only require one skill at a time." Finally, one teacher said that the curriculum did not provide enough suggestions on how to differentiate instruction and that the curriculum "caters more to advanced classes than on-level kids."

Students are grouped into classes based on ability level: advanced, on-level, and inclusion students. Two reading remediation courses are offered to students at risk of academic failure across all three grades.

Redland uses the Read 180 program to support students who are "really struggling readers." Read 180 utilizes three main components: 1) whole group instruction, 2) three station-rotations consisting of instructional technology, independent reading, and small group, and 3) whole group instruction (5-10 minutes). Some of the skills that Read 180 emphasizes are how to make meaning from text and writing strategies (e.g. thesis and claim statements). One teacher described the role of the program as part of a

concerted effort to "identify struggling readers and implement strategies to help them." The course is offered as a double period.

A developmental reading course (Reading REWARDS) is offered to special education students and focuses on improving decoding and writing skills. Students are placed into the course based on their Individualized Education Plan (IEP) and assessment data. Reading REWARDS is a commercial program designed for struggling adolescent readers and includes several components. Redland uses REWARDS Intermediate to provide direct instruction on decoding strategies and REWARDS Writing to provide direct instruction on sentence writing and revising. There is also a software program, Reading Assistant, which is used to give students practice with independent oral reading.

Math

Redland uses the math curriculum developed by MCPS. The district is still working on aligning its math curriculum with the Maryland College and Career-Ready Standards (MCCRS). However, several MCCRS aligned math courses have already been rolled out. These include Algebra I and Math 6. The primary math courses offered are: Math 6 (grade six), Investigations in Math (grade seven), and Algebra 1 (grade eight). The school also offers a course in Pre-Algebra and Honors Geometry.

The new math curriculum (Curriculum 2.0) is designed to focus on conceptual learning and problem solving and allow students to drive more of their own learning. The teacher acts as a facilitator who helps students think critically about how to solve problems. In other words, there is less skill-and-drill and more application of math concepts to solve problems. As noted in a presentation to parents on the shift to Curriculum 2.0, "the emphasis is no longer on the procedure... It's about the thinking. Students should be thinking 'How do I get the answer?'"

Redland has implemented several strategies to support the transition to Curriculum 2.0, particularly in algebra. First, there is an Algebra Support Club every Wednesday for an hour after-school that provides students with instruction on topics that have proven challenging (based on teacher feedback). Second, algebra courses use a co-teaching model to facilitate individual feedback and instruction to students. Third, students can receive help from teachers during lunchtime. Finally, the advisory period can be used to provide students with support for completing their algebra work.

No commercial math programs are used in the school either for general instruction or intervention purposes. However, the Algebra I course utilizes CK 12 Flexbooks that are open-content web-based textbooks aligned to course units. These Flexbooks provide students with additional support in understanding the content.

Science

Redland offers the grade-level science courses designed by the district. Grade six students take Investigations in Science 6, which is a combination of chemistry and earth science. For example, students learn about matter and its interactions or about human impacts on the environment. Grade

seven take Investigations in Science 7 and solve scientific problems in the areas of biochemistry, genetics, and others. Students in grade eight take a course in early space systems. Everything is problem and project based.

Science courses utilize the Prentice Hall Science Explorer books along with other materials. As one teacher noted, "We follow the curriculum to a T."

Advanced Instruction

Students are offered advanced courses across the content areas. The school offers Advanced English, Honors Geometry, Advanced Algebra, Advanced World Languages, Advanced World Studies, Advanced U.S. History, Advanced Orchestra, and Advanced Band. Placement in advanced courses is determined by several factors including student data (grades, standardized test scores), teacher recommendations, parent recommendations, and student initiation/interest.

Assessments

In the 2014-15 school year, MCPS made the transition from the Maryland State Assessment (MSA) to the Partnership for Assessment of College and Career Readiness (PARCC) tests. The PARCC is a summative assessment conducted in two parts: 1) the Performance Based Assessment, which focuses on skill application and 2) the End-of-Year Assessment, which focuses on comprehension and understanding. Staff framed state assessments as useful for providing a big picture view of student performance.

Redland uses MAP-R (Measures of Academic Performance of Reading) and MAP-M (Measures of Academic Performance of Math) – which are computer-based assessments administered to all grade three through eight students in the district – to help guide instruction. These assessments were framed as "developmental" since they track student growth over the course of the school year. MAP assessments must be administered at least twice per year (in the fall and spring) and schools are given the option to administer these tests in the winter as well. MAP-R scores are used to group students by reading ability and to help teachers select books appropriate for a student's reading level. These data are also used to identify which students could benefit from small group instruction led by paraprofessionals.

At the start of each quarter, teachers administer pre-assessments to determine students' skill levels in specific areas such as writing. These pre-assessments are developed by MCPS and Redland teachers. The pre-assessment tests are used to understand what students know at the beginning of the quarter and to support teachers' planning and instruction. Pre-assessments are also used to determine which students might benefit from additional help from support teachers such as the reading or math specialist. Students often take the same pre-assessment at the end of the quarter to gauge progress.

Teachers develop their own formative assessments that are aligned to the curriculum and that build toward the content that is covered on the district's end of semester summative assessments. Additionally, the district has formative assessments that take the form of mid-semester exams.

Finally, teachers use "checking for understanding" to informally assess how well students understand a lesson. For example, teachers will stop for a break midway through class and ask students to quickly rate their understanding of the lesson or give a one-question quiz. While this is not an assessment per se, teachers have found it useful to monitor students as their lessons are being delivered. Additionally, these data help teachers adapt instruction and figure out how to present information in a way that the students will understand.

Interventions and Supports

The school's principal indicated that some students require support to meet basic educational needs. As he noted, "We have students that don't come with paper and pencils and the district doesn't provide it, so it comes out of teachers' pockets." Some parents donate paper, pencils, hand sanitizer, paper towels, and other supplies. The school participated in a free breakfast pilot program in April and May 2015 and the principal is hopeful that the program will continue into the 2015-2016 school year.

Redland has multiple interventions for students at risk of academic failure and for those who require additional support. Several interventions target students who are struggling in the areas of math and English/language arts (based on grades and assessment data). Additional interventions target LEP students, special education students, and students with behavioral concerns.

Interventions for students who are struggling academically include the following:

1. Extended day programs are offered after-school from October to March, and provide one hour of instruction in math and reading. The program is targeted to students based on math and English needs. As a result of having these students in a targeted program, teachers across the content areas discuss these students and their needs during collaborative meetings and reach out to provide them with extra help. There are two sections with about 40-50 students and two teachers.
2. After-school tutoring is available for students "who are really low" and are in need of extra support to complete their schoolwork. These students receive two hours of after-school instruction provided by the principal and teachers.
3. Teachers make themselves available to students before- and after-school and during the lunch hour. As one teacher said, "Now it's a way of life that you call in a kid for lunch if he's struggling. Teachers will be here early in the morning or after-school to provide help."
4. Reading specialist who supports teachers to integrate reading strategies into their course instruction. The math focus teacher supports the school's algebra courses. Specifically, she works with a group of 17 students from all four sections of algebra who require support

strengthening or mastering the pre-requisite skills necessary in the course (such as solving one- and two-step equations and operations with integers). This work is all done as push-in rather than pull-out.

5. Saturday school is also available for students who are not performing on grade-level and is provided at an off-site location. The George B. Thomas Sr. Saturday School provides tutoring and mentoring in reading, language arts, and mathematics. Classes are held from 8:30 to 11 a.m. from September through May. It is marketed as providing an "extra day of instruction." However, one teacher noted that the program is underutilized and that only about 15 Redland students participate in the program.
6. Summer school is also available, but students must pay a fee to participate. Financial assistance is available.

There is a daily 20-minute advisory period that gives students "an opportunity to meet in small groups with one of their teachers." Redland uses the advisory period as an informal intervention. The majority of the school's teachers are charged with teaching one advisory group. The focus of the advisory period is not static, rather it was described as "a way to get the discipline lessons out, positive climate messages out that we wanted to get, study hall…study skills, PARCC readiness…read quietly, do homework. [It] gives kids time to spend extra time working [and] getting help with a teacher." It can also be the site of mini-interventions. One teacher noted that the advisory period once "served as a Band-Aid" to help with issues that had been identified with student performance in reading. It may still serve that purpose given that the school's course bulletin frames the program as time for "re-teaching or re-assessing" students. Moreover, it serves as a place where students can build a relationship and bond with a teacher.

There is an underlying push to get LEP students enrolled in extended day, after-school tutoring, summer school, and Saturday school. LEP students who have lower levels of English language proficiency receive a double period of instruction. The school uses the Sheltered Immersion Observation Protocol (SIOP), which is a method of instruction that focuses on language development and content. In other words, students are expected to meet both a content objective and a language objective.

Special education students are taught either in the classroom through an inclusion model or assigned to self-contained classes depending on their Individualized Education Plan (IEP). For the inclusion model, the general education and special education teacher co-teach. Self-contained classes have around 10 to 12 students and some students have a designated paraprofessional. Special education students receive reading and math interventions, such as developmental reading. Additionally, there is a mixed-grades resource class that serves as a pull-out for special education students who are in the mainstream general education program but require small group instruction in specific content areas such as math.

Finally, the school has an Alt 1 program for students with behavioral issues and other challenges or "who might be on their way to [an] alternative two school." Alt 1 offers a small class of four to five

students and provides students with mentorship and one-on-one help. It is not easy to get into Alt 1, as one staff member noted, a student has "to be failing or have a huge behavior issue that must be documented" and evidence needs to be provided that interventions have been attempted in the classroom for a couple of months before a student is enrolled in the class. Exiting Alt 1 is based on improvements in grades and behavior. If additional support is needed, students are considered for placement in an alternative school (MCPS call these Alt II and III programs).

Collaborative Teams and Professional Development

Collaborative Teams

Teachers at Redland teach five of the seven periods. One free period is devoted to planning and the other is devoted to professional development and collaborative work. Here is the weekly schedule for collaborative teams and professional learning:

- Monday – professional development
- Tuesday – grade-level team meetings
- Wednesday – collaborative planning
- Thursday – grade-level team meetings
- Friday – collaborative planning

Grade-level team meetings are held twice per week. One of these days is spent on professional issues and the second on "kid talk" or discussions about the performance of specific students on formative assessments, MAP-R, or other assessments. There has been some discussion of focusing team meetings on departments rather than grade-levels, but the school is too small for that structure to work. Instead department meetings are held once a month after-school.

Collaborative planning time was instituted with the goal of having many of the content teachers meet to plan together for consistency across the board. As enrollment has decreased and the school has gotten smaller, trying to find collaborative planning time has become more difficult. One staff member noted, "It gets really tricky."

Professional Development

Redland has one staff development teacher who provides professional development (PD) for teachers. The district created these positions in 2000 and when the staff development teacher first began. "No one knew what to do," according to one teacher. Teachers had varying opinions about the professional development offered at Redland. Some teachers expressed waning enthusiasm for the initiative:

> "Looking back, those first meetings were very good, all together, learning how we could all grade consistently. It's evolved to a point where people really don't want to go to it every Monday. We've had three or four different staff development teachers and some were turned off by one and it kind of bled off onto the other one. Might not like [it], but you gotta do them."

While others described increased buy-in for weekly PD:

> "[The] expectation that we meet every week for professional learning was not something [new staff] were accustomed to. This year there is a lot more buy-in and people are learning things that they can implement… People have come to the realization that you are going to meet on Mondays and you're going to have things to do.

The structure of professional development has changed from year to year. During the 2013-14 school year, "everyone learned about the same thing and met every week…[but] the kids didn't want to do the strategy because all teachers were doing the same thing…so we shifted to learning multiple strategies." For the 2014-15 school year teachers learn strategies during one PD session, have a week off to plan, a week off to implement, and then meet to reflect on what happened.

Moreover, the content of PD changes to align with the goals articulated in the SIP. In 2014-15, content was focused on strategies to help students acquire academic language. The professional development progression is planned out for the whole year and includes different objectives for instructional leaders (e.g. content specialists) and teachers. For example, in September 2014 members of the instructional leadership team developed a definition of academic language at Redland. In October through December 2014, teachers created a mastery level language objective. The date that these tasks are accomplished is recorded as is the number of teachers who meet the specified PD goal.

School Culture and Leadership

When the former principal assumed leadership of Redland the school's climate and culture was in complete disarray, "Early on in school year 2007-08 [there were] over 1,200 office referrals [and] 160 out of school suspensions." As a result, instruction was negatively impacted. Teachers did not have time to focus on student engagement in the learning and higher-level thinking because they "were playing whack-a-mole with behavior issues."

The principal's first major initiative was to improve the school climate. As mentioned earlier, PBIS was implemented. PBIS is a behavioral intervention model used to enhance students' academic and social behavior. A number of half-days were also set aside for staff, parents, and students to "work on what they saw Redland becoming." PBIS rewarded students for good behavior and helped teachers learn strategies such as purposeful teaching, modeling behavior, using the same language, and engaging parents and students in the discussion.

The principal and school leadership team focused on defining roles in the building, "what does the teacher have the authority to do" and providing strategies for teachers to implement when students acted out. The former principal noted that teachers were trained that "If this happens, don't send the kid out. Here are steps you can take proactively. Everything was reactive. But how can you structure your classroom?" A behavioral matrix was also developed that specified what was expected and emphasis was placed on developing an understanding of why certain things were happening and how

they could be addressed. The school's leadership team created a circle of respect – yourself, others, school – for students to adhere to and instituted student town halls to learn about student perspectives on the school. Students were asked what they were seeing in class, in the halls, and what they thought about instruction. Redland also hosts an honor roll celebration every quarter and acknowledges exceptional students with the Top Dog award.

One challenge facing the school is building a stronger understanding of student culture and background and integrating this knowledge into instruction. A recent Study Circle, a MCPS program that aims to "identify, examine and eliminate institutional barriers to African American and Latino student achievement," revealed that Latino and LEP students believed "that their teachers didn't care about them." One teacher expressed confusion at this sentiment and asked, "Are we sitting in the same school building? Can we work in a different way to connect and engage our students?" Another teacher noted that they did not "know if our teachers understand the differences in cultures – not purposefully – school is very color blind. Don't see the difference that each kid brings to the table. Everybody is working super, super hard, [I] just don't know if they're working smart."

The school's leadership recently changed. As noted earlier, the current principal is in his second year at Redland. One teacher felt very optimistic about the new leadership, "We have new blood this year, so there's new hope."

Summary

Between 2007 and 2012, Redland saw large gains in student achievement on the MSA, particularly for low-income students. During this time period the percent of low-income students scoring proficient or above increased 24 percentage points. Interviews with staff members and the current and former principals point to several factors that have contributed to these increases in student achievement:

1. Data-driven school improvement initiatives. Root cause analysis is used to determine school goals and set the focus for School Improvement Plans (SIP). The process allows the school leadership team to "drill down" and set targeted and achievable goals that focus on specific groups of students for the benefit of the whole school. In the words of one teacher, "What is good for one is good for all."
2. Focus on school climate. Several initiatives have been implemented to foster a positive school climate. Positive Behavioral Interventions and Supports (PBIS) provides students with rewards for positive behavior but also facilitates the creation of school-wide expectations and the use of a common language. Student town halls are held every quarter so that school staff and leadership can hear student perspectives on what is happening at the school. Students are also rewarded for strong academic performance via honor roll celebrations and the "Top Dog" award.

3. Multiple interventions. The school has multiple academic interventions such as after-school tutoring, Saturday school, and extended day programs. An advisory period is used to foster relationship-building between teachers and students and to deliver small group instruction. Behavioral interventions include the Alt 1 classroom for students with behavior and other challenges and the school-wide PBIS program that sets expectations and provides incentives for positive student behavior.
4. Teacher support and professional development. Teachers meet for collaborative planning twice a week and for team meetings twice a week. Professional development is held every Monday. Teachers' professional development is led by the staff development teacher and English language teacher development coach, and focuses on providing strategies for implementing instructional practices aligned with the school improvement plan.

Alignment with the EB Model

Many of the strategies implemented by Redland Middle School to boost student performance are aligned with the EB model. First, the school uses a root cause analysis to develop its annual school improvement plans, which relies on the examination of several data sources to get a deeper picture of student performance.

The school's instructional leadership team often engages in data-based decision making. Data from the MAP-R and MAP-M assessments are used to drive instructional improvements. Importantly, staff put a "face to the data" by identifying students who were in multiple subgroups and prioritizing those students for support. Student placement in intervention is also determined by data – certain students are targeted for after-school tutoring.

Professional development is offered on a regular basis and led by the staff development teacher. PL is structured to follow a specific learning progression with set learning targets and demonstration of teacher understanding. The school does not have any instructional coaches per se, but rather leans on the staff development teacher and content specialists to provide support and coaching to teachers.

Multiple interventions have been implemented to support students at risk of academic failure. The school has academic interventions such as extended day, after-school tutoring, Saturday school, and Read 180 for struggling readers.

Finally, several elements of school's staffing structure exceed what is recommended in the EB model, including the number of school administrators and instructional coaches. However, staffing falls short in the area of electives. Redland has 7.5 FTE elective teachers, which falls just below the 7.96 FTE recommended by the model.

Taken together, Redland has leveraged several strategies to spur improvements in student achievement and continues to work towards ensuring that all students succeed. At the end of the day, their success rests on the participation of the entire school community. As the former principal said, "If we hadn't

purposefully engaged our staff, parents, and students to keep everyone on the same page we would not have been able to go where we went. Everyone had a piece in creating it and we could call on them to support it while we were moving."

Chapter XII: Somerset Intermediate School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Executive Summary

Somerset Intermediate School is an example of the second category of schools – a school that has achieved a significant amount of academic growth over time.

Somerset Intermediate School, the only intermediate school in the Somerset District Public Schools (SCPS), formed in 2004 from the consolidation of two District middle schools. According to school documents, in 2014-15 the school served 409 grade six and seven students. Data from the Maryland Report Card indicate that in 2014, most of the students were either African American (44.8 percent) or white (43.5 percent). Three-quarters (75.8 percent) of students at Somerset Intermediate were eligible for free or reduced-price meals (FRPM), and 18.6 percent of the students received special education services.

From 2007 to 2012, Somerset Intermediate School demonstrated high growth in terms of the percentage of students who scored proficient or advanced in reading, mathematics, and science on the Maryland School Assessment (MSA). Specifically, the percentage of students who were at the proficient or advanced level increased 32 percentage points from 2007 to 2012 (54.6 to 86.9 percent).[53]

A number of resources likely contributed to these gains in student performance. Among these resources are:

1. A clear focus on the core subjects. Somerset Intermediate School prioritizes the core subjects of English/language arts, mathematics, science, and social studies. This prioritization is especially clear with respect to:
    a. Staffing. Analysis of the school's staff suggests that the school targets many resources toward its core program. Specifically, the school employs a relatively high proportion of core teachers. It also employs special educators who co-teach in English/language arts and mathematics classes, special education aides who assist in science and social studies classes, intervention teachers for English/language arts and mathematics, and two full-time instructional coaches for English/language arts and mathematics.
    b. Intentional use of time. Students spend four out of five class periods in core classes. Students at risk of academic failure use the fifth period of every other day for core subject intervention. Teachers work in teams that include educators from each core subject area, and they have regular opportunities to collaborate with their content-area colleagues during regularly scheduled after-school professional development sessions.

[53] Differences were calculated using unrounded numbers.

2. Multiple supports for students at risk of academic failure. As noted above, administrators, coaches, and teachers at Somerset Intermediate work hard to create and maintain a strong core curricular program. They also provide multiple academic and behavioral supports for students at risk of academic failure. These supports include academic interventions within the school day. They also include a number of behavioral programs that are administered or coordinated by the school's behavior support specialist and counselor.
3. A supportive, collaborative staff. School staff report that one contributor to student success at Somerset Intermediate is a staff culture that is marked by trust, support, and collaboration. Staff members note that previous and current school administrators as well as teachers value collaboration and that they use professional development and collaborative planning time to create and sustain this school culture.

Introduction

Somerset Intermediate School is located in Westover, a town in the central Somerset County Public Schools district. The Somerset district, part of Maryland's Eastern Shore, is bordered to the west and south by the Chesapeake Bay and to the east and north by other Maryland counties. According to information from the state archives, as of the 2010 census, the district had a population of approximately 26,000 residents. Parents of students at Somerset Intermediate work in a range of occupations such as agriculture, healthcare, and the public sector (e.g. state or district agencies, corrections, and the public school system).

Somerset Intermediate School is the only intermediate school in Somerset County Public Schools (SCPS). The school is relatively new. In 2004, SCPS consolidated two middle schools to create Somerset Intermediate. Grades six and seven students who had attended the middle schools began to attend the intermediate school, while grade eight students went to one of the district's two high schools. For the first few years after the merger, Somerset Intermediate used facilities that already existed in the district. The district constructed a new, larger building for the school, however, and in 2009, Somerset Intermediate moved to the new facilities.

Because it is the only intermediate school in the district, some students travel relatively long distances to get to school. Four different elementary schools feed into the intermediate school, and students from the school matriculate to one of two different high schools. Overall enrollment numbers have been relatively stable across years. According to school documents, the school enrolled 210 grade six students and 199 grade seven students in 2014-15, for a total of 409 students. Table 1 shows the average number of students per homeroom by grade.

Table 1
Somerset Intermediate School Class Sizes

Grade-level	Class Size
Six (10 homerooms)	21
Seven (10 homerooms)	19.9

Note: Based on a total enrollment estimate of 409 students.
Source: Somerset Intermediate School documents.

In 2014, most of the students who attended Somerset Intermediate School were African American (44.8 percent) or white (45.3 percent). While the school did not serve a large percentage of limited English proficient (LEP) in 2014, 75.8 percent of the students were eligible for FRPM, and 18.6 percent of the students were in special education (Table 2).

Table 2
Somerset Intermediate School Student Characteristics, 2014

Student Characteristics	Percentage of Somerset Student Population
Race/ethnicity	
American Indian/Alaska Native	-
Asian	-
Black/African American	44.8
Hispanic/Latino	4.8
Native Hawaiian/Pacific Islander	-
Two or more races	4.6
White	45.3
Student eligible for free or reduced-price meals (FRPM)	75.8
Limited English Proficient (LEP) Students	-
Special education students	18.6

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.
Note: These percentages are based on a total enrollment estimate of 417.
Source: Maryland Report Card (www.mdreportcard.org).

Student Performance

From 2007 to 2012, Somerset Intermediate School demonstrated high growth in terms of the percentage of students who scored proficient or advanced in reading, mathematics, and science on the

Maryland School Assessment (MSA). Specifically, the percentage of students who were at the proficient or advanced level increased 32 percentage points from 2007 to 2012 (54.6 to 86.9 percent; Table 3).[54]

Table 3
Somerset Intermediate School Performance, Maryland School Assessment (MSA), 2007-2014

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	54.6	69.3	75.5	85.4	86.0	86.9	85.0	63.7
Free and Reduce-Priced Meals (FRPM) Students	46.7	63.9	71.0	82.4	82.6	84.7	NA	NA
Limited English Proficient (LEP) Students	58.3	-	-	-	-	-	NA	NA
Special Education Students	25.8	52.7	55.8	78.6	86.2	78.0	NA	NA
Non-white/ Non-Asian Students	49.7	61.9	66.8	77.8	80.7	85.0	NA	NA

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.
*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.
Source: Data provided by the Maryland State Department of Education (MSDE).

School staff attributed these student achievement gains, at least in part, to resources that allow them to collaborate with each other and to create and sustain a supportive school culture. This case narrative explores these and other resources that have been integral to improving student achievement at Somerset Intermediate School.

The case has 11 sections: 1) school performance, 2) school staffing, 3) school goals, 4) school schedule and collaborative planning time, 5) curriculum and instructional program, 6) assessments, 7) extra help for students at risk of academic failure, 8) professional development, 9) school culture and leadership, 10) summary and challenges, and 11) the degree of alignment between the school's strategies and the school improvement strategies embedded in the EB Funding Model. These sections of the report draw upon information from a review of documents provided by school officials or available online and individual and focus group interviews held in early February 2015 with school staff, including school administrators, instructional staff, and support staff.

[54] Differences were calculated using unrounded numbers.

School Staff

Following the consolidation of the two middle schools in 2004, school leaders formed the staff for the new Somerset Intermediate School. During the interview process for the new school, staff members learned about the vision and mission of the new school and were selected to teach in the new school due, in part, to their willingness to accept and support this mission and vision. In recent years, the school has experienced frequent turnover in the principal and assistant principal positions, which were filled with relatively novice administrators. The current school administration has been in the building for two years and has prior administrative experience. Table 4 presents an overview of Somerset Intermediate School staff by full-time equivalent (FTE) positions for the 2014-15 school year.

Table 4
Staffing in Somerset Intermediate School, 2014-15

Category	FTE
Administration	
Principal	1
Assistant Principal	2
Clerical Support	3
Main Program	
Core Teachers	20
Elective Teachers	7
Instructional Coaches	2
Special Education Self-Contained	1
Special Education	4
LEP teachers	1
Interventionists	2
Aides	
Special Education (Self-Contained)	1
Special Education (Inclusion)	2
Pupil Support	
Guidance Counselor	1
Nurse	1
Behavior Intervention Specialist	1
Other Behavioral Pupil Support	1
Cafeteria Staff	4
Custodians and Maintenance Staff	5

Source: Personal communication with school staff.

Twenty teachers instruct students in the core subjects of English/language arts, mathematics, science, and social studies. Based on enrollment information from school documents that report 409 students in 2014-15, the average core class size is 20 students. The school's seven elective teachers focus on art, technical education, physical education, band, music, and media. Because the media specialist has a

background in science, technology, engineering, and mathematics (STEM), she frequently provides professional support to the school's science teachers.

A variety of educators provide extra support for the instructional program. The school employs four special educators who co-teach with general education teachers. Beginning this year, these special educators are departmentalized such that each educator focuses on either mathematics or English/language arts. Two special education teacher aides assist in social studies and science classrooms. The school has one teacher who focuses on LEP instruction. The school also has two interventionists. One of these interventionists focuses on English/language arts and the other focuses on mathematics. A number of years ago, the school employed one intervention teacher, but the school administration replaced an elective position (home economics/family and consumer science) with a second intervention teacher.

One special education teacher works exclusively with students who have severe and profound needs. These students learn in a self-contained environment. They focus on acquiring the knowledge and skills they will need to participate in society. In addition to the special education teacher, one special education aide works with these students.

The school staff includes two non-teaching instructional coaches. One of these coaches focuses on English/language arts and the other on mathematics. Because the school does not employ instructional coaches for science or social studies, the school's assistant principals support these teachers when possible.

The school employs a behavior specialist who works in a variety of capacities to help students demonstrate positive behaviors in the school environment. Additionally, the school has one counselor, who works closely with the behavior support specialist, teachers, and students. The school also has another pupil support staff member who works with students who need time to reflect on their actions and for students who are serving in-school suspensions. In addition to the pupil support personnel listed in Table 12.4, the school has access to district-provided socioemotional supports. The school shares a school psychologist with a high school and an alternative school. The district also provides centrally staffed social workers and the school has access to the services of these personnel if needed.

In sum, the school has a number of human resources to support the work of improving student achievement. The school demonstrates a specific commitment to the core subjects. The school provides: 1) a high proportion of core teachers, 2) small class sizes in core courses, 3) additional supports for students who may struggle in English/language arts and mathematics (special educators, interventionists), and 4) additional supports for teachers of English/language arts and mathematics (non-teaching instructional coaches). The school supplements this focus on core subjects with streamlined electives and a variety of pupil support personnel.

School Goals

Teachers at Somerset Intermediate report that they have a major influence over the school's goals and have had this influence since the founding of the school. While individual teachers have goals for classes and students within them, formal school goals are the purview of the school improvement team, made up of administrators, teachers, and other staff members. The school improvement team has three subcommittees: 1) literacy, 2) mathematics, and 3) school climate. The team meets at the beginning of the year to set school improvement goals and then meets monthly to examine student data and analyze how students are doing in terms of literacy performance, mathematics performance, and behavior.

School staff reports that the shift to the Maryland College and Career-Ready Standards and the Partnership for Assessment of Readiness for College and Careers (PARCC) assessment has impacted the process of creating school goals. The newness of these systems has introduced some uncertainty into the goal-setting process. Still, the school continues to monitor progress toward the achievement of student performance and behavior goals. For the 2014-15 school year, the school set a goal of 60 percent of students in both the grades six and seven becoming proficient on district-determined benchmarks in both English/language arts and mathematics.[55] Specific areas of focus for English/language arts for 2014-15 include writing and vocabulary, and specific areas of focus for mathematics include making sense of problems and persevering to solve them. School climate goals include improvements in student attendance and reductions in discipline referrals.

School Schedule

Students begin their school day at 7:35 a.m. with a 10-minute homeroom period. After this homeroom period, students have five periods that last 70 minutes each, with the exception of one period that lasts 100 minutes (30 minutes for lunch). Students end their day at 2:30 p.m. Each day, students take four core classes and one elective class. Because students are enrolled in two electives each quarter, they attend each elective class every other day.

The school takes an individualized approach to scheduling students to homerooms. The principal has a transition meeting with every incoming grade six student and his or her parents during which the principal and parents discuss the student's academic and behavioral background. The principal and assistant principals then assign students to homerooms so that the students are matched with teachers whose strengths align with their needs. In addition to matching individual students to teachers, the school administrators assign special education students to classes with particular grouping strategies in

[55] The school's student achievement goals are tied not to the annual state assessment but rather to district benchmark assessments. Table 3 demonstrates that high percentages of Somerset Intermediate students performed at the proficient or advanced levels on the state assessment (the MSA). Therefore, a goal of 60 percent of students achieving proficiency on district benchmarks may seem low. However, school documents report that the percentages of students who achieved proficiency on these district benchmarks was below 60 percent prior to and/or at the beginning of the 2014-15 school year.

mind. Specifically, in an effort to target support to special education students, administrators group special education students with their peers without disabilities in half of the classes in the school.

Curriculum and Instruction

Curriculum

In addition to the core curriculum of English/language arts, mathematics, science, and social studies, the school offers a streamlined selection of electives including band, chorus, art, physical education, technical education, and media. In grade six, the focus of media education is mass communications, whereas in grade seven, the focus is STEM.

Across the core disciplines, teachers report that they supplement district pacing guides and curriculum maps with school-created curriculum. Teachers report that they gather external curricular materials by themselves, in teacher groups, and (in the case of English/language arts and mathematics teachers) with assistance from instructional coaches. While teachers use textbooks for some purposes, the extent to which teachers rely on them is mixed. Teachers of some subjects, particularly social studies, use the textbooks fairly regularly while teachers of other subjects, such as English/language arts, mathematics, and science, do not rely as heavily on texts. In some cases, teachers do not have enough textbooks to assign to students for use at home.

A common theme among discussions with staff is that the district- and school-level curricula are in transition due to the shift to the new state standards and the associated PARCC test. Staff members are actively working to ensure that their curricular materials align with the new standards and assessments. The school's English/language arts and mathematics instructional coaches have created scope, sequences, and curriculum maps to match the Common Core and PARCC, and science teachers have aligned their content with the Next Generation Science Standards.

The main resources that support a strong curriculum at Somerset Intermediate are time for common planning for all core teachers (discussed in more detail below in the section on professional development) and two full-time non-teaching instructional coaches for English/language arts and mathematics. Especially within a context of new standards and assessments, teachers' ability to collaborate with each other and with content-area experts allows them to navigate the transition and to create and maintain a robust core curricular program.

Instruction

Teachers at Somerset Intermediate report that they utilize many instructional strategies, rely on different student grouping strategies for different instructional purposes, and use a variety of instructional materials, including technological resources. The following paragraphs illustrate these reports.

Teachers' instructional strategies include direct instruction as well as project-based learning. Multiple staff members reported that they often use projects or lab activities to convey course information

because they value hands-on work and cross-student collaboration. Teachers also explain that they try to incorporate multiple activities into a single lesson regardless of the lesson's format as direct instruction or project-based. Examples of these activities include using exit tickets, or short assignments at the end of lessons aimed at assessing the extent to which students grasped the day's content; having students work on brief constructed responses; asking students to draw pictures about what they learned; focusing on vocabulary; using a "3-2-1" approach (for instance, having students write down three things they learned, two things they wanted to learn more about, and one thing they had a question about); applying the lesson to current events; and using intentional questions or probes to gauge students' familiarity with the content.

Teachers report that they group and re-group students often in classes. Teachers sometimes group students based on ability (both in terms of grouping students with similar ability and in terms of mixed-ability groups). Other times, teachers group students not by ability but rather with the goal of ensuring that students have the opportunity to work with all other students in the room so that they have the chance for broad interaction with their peers.

According to staff, teachers at Somerset Intermediate have access to instructional technology. Among these technological resources are laptops for the grade seven students. Students use the laptops to perform research, to write, and to access online learning materials. Despite the utility of these instructional resources, staff members report that funding for maintenance is an issue.

In sum, the key resources that support instruction at Somerset Intermediate are educators' knowledge of different instructional techniques and the ability to share these techniques with each other during collaborative planning time. The school also relies on instructional materials such as laptops, though teachers report that they would be able to rely more on these materials if they had additional resources to keep them in proper working order.

Assessments

Educators at Somerset Intermediate School use a variety of assessments. Some of the assessments, such as the Scholastic Reading Inventory (SRI) and the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), are commercially available. Other tests are provided by the State. In prior years, the state test was Maryland School Assessment [MSA] and this year (2014-15) the MSA will be replaced by the PARCC assessment. Somerset Intermediate educators generate other assessments. These tests include English/language arts and mathematics benchmarks that were created by instructional coaches and unit tests created by teachers of all core subjects.

Staff at Somerset Intermediate use data from the SRI and DIBELS to place students into classes and interventions. The school uses results from the state tests to monitor overall school performance and to examine performance by subgroup, such as by race/ethnicity, by special education status, and by FRPM status. The school uses information from school-created assessments to shape curriculum and instruction. Instructional coaches hold data meetings with teachers to analyze student performance and

discuss what the results of student data mean for lesson planning. They look at overall proficiency as well as proficiency for student subgroups. Coaches and teachers analyze test items to determine if instruction is effective, whether lessons are more effective for some groups of students than for others, if students have an accurate understanding of content, and if assessment questions accurately measure the construct they intend to measure. While all core teachers look at data, the process is more formalized for teachers of English/language arts and mathematics, since the school has instructional coaches for these subjects.

As noted above in the section on instruction, teachers at Somerset Intermediate report that they value project-based instruction. Accordingly, teachers often use rubrics to measure student performance on projects. They use this information alongside the information gained from test-based assessments to determine the extent to which students are demonstrating mastery of course content.

In addition to access to the externally-developed tests, staff at Somerset Intermediate require time to collaborate with their colleagues to create tests and rubrics, analyze test data, and create lesson plans that take student assessment results into consideration. They also rely on the instructional coaches to assist them in the work of creating assessments and analyzing student performance on these assessments.

Interventions

Somerset Intermediate School provides a number of interventions for students at risk of academic failure. While some of the interventions are targeted more directly toward students' academic needs, other interventions are targeted toward students' behavioral needs.

Academic Interventions

One way in which Somerset Intermediate attempts to provide academic assistance for students who may need extra help is to provide extra support within the core instructional program. As mentioned in the section on school staff, the school employs four special educators who co-teach in classrooms with general educators. These special educators focus exclusively on English/language arts or mathematics, and their presence ensures that students will have consistent access to two educators within the classroom setting. While science and social studies classrooms do not have special educator co-teaching arrangements, these classrooms do have access to special education aides who can assist in the classrooms for approximately 30-minutes every day. While this support may not be as intensive as the support available for English/language arts and mathematics, it nonetheless represents a core program support to which Somerset Intermediate students have access.

Another way the school attempts to assist students at risk of academic failure is to provide extra instruction within the school day, outside the regular instructional program. As mentioned in the section on the school schedule, students take two elective courses per quarter. When students are struggling to master content in English/language arts or mathematics, the school assigns students to an intervention for one of those elective courses. While some students do have two intervention periods in a quarter,

the school tries to limit student participation in intervention to one course per quarter so that the students can also participate in an elective course. According to school staff, intervention classes average about six students per class. Within these intervention periods, the school uses the Read Naturally Live and Read 180[56] programs for students who struggle in English/language arts and Dreambox software for students who struggle in mathematics. Because the math interventionist perceives that some of the Dreambox lessons to which the school has access are targeted toward younger learners, the math interventionist supplements this software with other materials.

In addition to the formal interventions embedded within the school schedule, the school and its faculty provide students at risk of academic failure with other academic supports. While the school does not have a formal tutoring program, students receive informal extra help from teachers during lunch hour or after-school. After-school tutoring is constrained for those students who live farther away from school and rely on school bus service for transportation. Additionally, the school assigns students to summer school if they are failing two or more core courses.

The major resource for providing academic support to students at risk of academic failure is a cadre of educators whose main role is to assist students who have challenges accessing content in the core program. This staff includes special education teachers, special education aides, and intervention teachers. Other key resources include the intentional use of time so that students can engage in academic interventions within the school day and access to the intervention programs themselves.

Behavioral Interventions

Somerset Intermediate uses a number of behavioral supports to encourage positive behaviors and address discipline issues. The primary source of behavioral support is the school's use of the Positive Behavior Incentive System (PBIS). When students engage in positive behaviors they earn "Heron Bucks" and can participate in special events organized by teachers and other school staff. Teachers perceive that PBIS has fostered positive behaviors throughout the school.

Sometimes, however, students face challenges that hinder their ability to engage in positive behaviors. Somerset Intermediate addresses these challenges in a number of ways. Many of these strategies involve the school's behavior specialist and counselor, who are major resources in the school's approach to dealing with discipline issues.

One approach to curbing discipline problems is the school's "check in, check out" program, which serves about 10 percent of the school's students. This system pairs students at risk of academic failure with a caring adult that they see every day. The behavior specialist keeps track of information from the check

[56] In order to align the program to available time, the school uses a slightly modified version of the Read 180 program. The program's design calls for 90 minutes of instruction each day, but Somerset allocates 60 minutes of instruction every other day so that they can provide students access to the program within the school day.

in, check out mentors so that the school can track these students' behavior, attendance, grades, and discipline referrals. The behavior specialist monitors students' progress as they become better equipped to participate in the school environment without behavior issues.

Another approach to dealing with discipline problems is by providing students who have displayed problematic behaviors in the past the opportunity to remove themselves from potentially volatile situations before they escalate. In these cases, the behavior specialist and teachers have created formal plans for particular students that include "cool down passes." These students can use their cool down passes to leave classrooms temporarily and visit the school's "time out" room if they need to take some time to regain composure after becoming upset, agitated, or overwhelmed.

The behavior specialist also implements three educational programs that target students who have struggled with behavior and discipline problems. The first, Why Try, is targeted toward students with the most extreme behavior challenges. The program focuses on skills such as goal setting, problem solving, motivation, and dealing with peer pressure. The second program, Second Step, teaches social skills and how to engage in positive peer interaction. It also focuses on helping students manage stress and anger, address bullying, and deal with issues related to drugs and alcohol. The Why Try and Second Step programs teach students positive behaviors and provide them with strategies they can use to manage conflict. The third program is a leadership course that the behavior specialist created out of a modified Second Step curriculum.

In some cases, the school will refer students to the learning support team process, whereby a team of adults that may include the behavior support specialist, the school counselor, teacher(s), special educators, LEP teachers, the student's mentor (if applicable), the student's parent(s), and others work together to identify the source of the student's problems and devise a plan to address these problems. These teams stay in place for as long as necessary to ensure that the student's needs are addressed. These teams may recommend supports that range from tangible resources (e.g. glasses for students who are falling behind academically or engaging in problematic behavior because they cannot see well) to a wide range of emotional supports. These supports may include the programs listed in the previous paragraphs or the services of the school counselor, the district's psychologist, or the district's social workers. They may also include counseling services from other district agencies that work with the school to provide students access to therapists at school so that transportation issues do not prevent students from accessing mental health services.

As highlighted in the previous paragraphs, the main behavioral resources to which Somerset Intermediate has access are the school's behavior support specialist and counselor. School district and other district personnel also provide counseling services to students at the school.

Professional Development

Teachers at Somerset Intermediate engage in a variety of professional development activities. Some of these professional development activities take place within the school day, while others occur on a

regular schedule after-school. Teachers also pursue external (that is, not provided through the school) professional development.

One major source of professional development stems from the organization of teachers into teams. There are five teams in the school. These consist of two teams teaching grade six students, two teams teaching grade seven students, and one team teaching both grade six and seven classes. Teacher teams include an English/language arts teacher, a mathematics teacher, a science teacher, and a social studies teacher. With the exception of the split-level team, the teams also include special educators who co-teach with other team members. Team members have common planning periods when they meet and collaborate on matters of curriculum, instruction, and student behavior. Teams meet at least once each week.

In addition to the collaborative team planning sessions, the entire school meets after-school once per week for an hour and 15 minutes. Each month, the school uses one of these weekly sessions for school-wide professional development. This academic year, teachers are reading and discussing a book on differentiated instruction. The school uses another one of these weekly sessions for teachers to meet within content areas and map curriculum, share materials, plan lessons, and analyze data. The school uses the third weekly meeting each month to allow time for self-directed professional development. Teachers report that they typically use self-directed professional development time to meet with content-area colleagues, since they perceive that subject-specific collaboration is beneficial for curriculum and instruction. The school uses the final meeting each month for whatever type of professional development (school-wide, content-focused, or self-directed) school staff need at that time.

The school's English/language arts and mathematics instructional coaches provide support to teachers in these within-school and after-school professional development sessions as well as throughout the school day. Instructional coaches provide a variety of supports to their teachers. For instance, they help teachers develop curricula, find curricular materials, and plan lessons. They also mentor teachers, co-teach, informally observe teachers, and provide feedback on instruction. Additionally, they meet with teachers individually and collectively to examine student data and determine how to use knowledge gained from analyses of student performance to improve curriculum, instruction, and student assessment. To support teachers as they transition to the new standards and assessments, instructional coaches report spending a great deal of time learning and sharing information about the College and Career-Ready standards and the related PARCC assessment. While instructional coaches provide these supports to all of the teachers of their content area, they pay special attention to supporting novice teachers.

Teachers at Somerset Intermediate also engage in professional development opportunities that take place outside the school environment. Teachers across subject areas report that they participate in professional development opportunities available through the district, through a nearby university, and through outside organizations. For example, science teachers and the media specialist often engage in

professional development through organizations like the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). Teachers say that the school routinely tells teachers about outside professional development opportunities and encourages their participation in them.

The main resources that support the school's pursuit of professional development for its teachers are the strategic use of time and access to instructional coaches. Because the school has intentionally organized teachers into teams and provided teams with common planning time, teachers have opportunities to meet with others who teach the same group of students and determine how to tailor the curriculum and instruction to those students. Because the administrators and teachers at Somerset Intermediate engage in collaboration during regularly scheduled after-school school-wide professional development sessions, teachers have the opportunity to work with subject-area colleagues. Additionally, the school's ability to have two instructional coach positions allows for a variety of teacher supports that are focused on the core areas of English/language arts and mathematics.

School Culture

Some parts of the school culture affect how the school staff members interact with each other, whereas other parts of the school culture impact how staff members interact with their students, their students' families, and the community at large.

Among School Staff

School staff members report that the time surrounding the creation of the school was "tumultuous." However, they note that it was also a time for growth and that the principal at the time of the merger worked hard to build a single, strong school community. Teachers who were present at the time of the merger recall that the principal held many professional development sessions focused on building a trusting team atmosphere. The principal prompted teachers to engage in honest, candid dialogue about the challenges they faced. The principal also used the time to encourage the teachers to actively create the type of environment they wanted for themselves and for their students. The staff reports that the school administrators and teachers collectively created a culture that was marked by trust, collaboration, and support.

The years between the merger and the current school year saw a number of changes in school administration. School staff report that a strong teaching staff and a strong school culture allowed the school to continue working toward student success amid multiple changes in school leadership. Teachers say that the school's collaborative culture pervades the building so much that new teachers who come to the school will not stay if they do not want to engage in collaboration.

The current school administration has been in place for two years. The staff reports that the administration continues to foster an environment of hard work, trust, collaboration, and support. Teachers say that they trust each other enough to ask for help when they need it and to provide help when they see that another teacher needs it. They say that the staff is tight-knit and that they

consistently support each other. School staff attributes this current culture of trust, collaboration, and support to five factors: 1) the groundwork laid at the time of the merger, 2) a supportive current administrator, 3) a team structure of teacher organization, 4) multiple opportunities for formal and informal collaboration, and 5) building-wide high expectations.

Among School Staff, Students and Families, and Community

Somerset Intermediate is the only intermediate school in the district, whereas the district contains multiple elementary schools and two high schools. Accordingly, the school provides a unique opportunity for students across the entire district to learn together.[57] This uniqueness, coupled with the small population size of both the school and the district, brings both opportunities and challenges.

As the only intermediate school in the district, students have the opportunity to form peer relationships that they otherwise might not have been able to form. The creation of relationships extends beyond student-to-student interaction. Teachers report that they work hard to create caring relationships with students during school hours in the classrooms and in the hallways. They also work to extend these caring relationships past the school day. To that end, teachers describe their efforts to go to sporting events and other community functions to demonstrate that they care about their students, their students' families, and the larger community. Additionally, perhaps in part because the population of the district is relatively small, school staff members report that there are opportunities for district schools to communicate with other district agencies regarding issues that students may face.

The school's unique situation as the sole intermediate school in the district does create a challenge. Because it is not a neighborhood school, most students and their families need to travel to the school by car or bus. The district provides bus service for students, but reliance on bus service makes it difficult for many students to stay after-school for extracurricular activities or extra help in core classes. Furthermore, transportation logistics make it challenging for some parents to come to the school building to meet with staff about their children.

Summary

Somerset Intermediate School, the only intermediate school in the Somerset County Public Schools (SCPS), formed in 2004 from the consolidation of two middle schools. According to school documents, in 2014-15, the school served 409 grade six and seven students. Data from the Maryland Report Card indicate that, in 2014, most of the students were either African American (44.8 percent) or white (43.5 percent). Three-quarters (75.8 percent) of students at Somerset Intermediate were eligible for FRPM, and 18.6 percent of the students were in special education.

[57] Because the district also runs one alternative school, it is not necessarily the case that all students in grades six and seven attend Somerset Intermediate; however, the vast majority of grade six and seven students attend Somerset Intermediate.

From 2007 to 2012, Somerset Intermediate School demonstrated high growth in terms of the percentage of students who scored proficient or advanced in reading, mathematics, and science on the MSA. Specifically, the percentage of students who were at the proficient or advanced level increased 32 percentage points from 2007 to 2012 (54.6 to 86.9 percent).[58]

A number of resources likely contributed to these gains in student performance. Among these resources are:

1. A clear focus on the core subjects. Somerset Intermediate School prioritizes the core subjects of English/language arts, mathematics, science and social studies. This prioritization is especially clear with respect to:
    a. Staffing. Analysis of the school's staff suggests that the school targets many resources toward the core program. Specifically, the school employs a relatively high proportion of core teachers. It also employs special educators who co-teach in English/language arts and mathematics classes, special education aides who assist in science and social studies classes, intervention teachers for English/language arts and mathematics, and two full-time instructional coaches for English/language arts and mathematics.
    b. Intentional use of time. Students spend four out of five class periods in core classes. Students at risk of academic failure use the fifth period of every other day for core subject intervention. Teachers work in teams that include educators from each core subject area and they have regular opportunities to collaborate with their content-area colleagues during regularly scheduled after-school professional development sessions.
2. Multiple supports for students at risk of academic failure. As noted above, administrators, coaches, and teachers at Somerset Intermediate work hard to create and maintain a strong core curricular program. They also provide multiple academic and behavioral supports for students at risk of academic failure. These supports include academic interventions within the school day. They also include a number of behavioral programs that are administered or coordinated by the school's behavior support specialist and counselor.
3. A supportive, collaborative staff. School staff report that one contributor to student success at Somerset Intermediate is a staff culture that is marked by trust, support, and collaboration. Staff members note that previous and current school administrators as well as teachers value collaboration and that they use professional development and collaborative planning time to create and sustain this school culture.

[58] Differences were calculated using unrounded numbers.

Alignment with the Evidence-Based Model

Somerset Intermediate aligns with the evidence-based (EB) model in a number of ways. Key areas of alignment include:

1. Laying a foundation for change. Somerset Intermediate came into existence due to the consolidation of two district middle schools. School leaders at the time of the merger worked hard to construct a school culture that was marked by collaboration and support. This foundation has endured. Teachers in the school maintained the collaborative environment during multiple changes in school leadership, and the current school administration has embraced collaboration and support.
2. Being strategic about core and elective classes. Administrators and teachers at Somerset Intermediate value elective courses and report that they perceive electives to be important for student success; in fact, the school employs a higher number of elective teachers (seven) than would be recommended by the EB model (four, based on a calculation of 20 percent of the number of core teachers). Still, the staff at Somerset Intermediate maintains a steadfast focus on core subjects. Multiple aspects of the school demonstrate this focus. For instance, the school employs 20 core teachers, which allows for an average core class size of 20 students, five students below the EB recommendation of 25 students in core classes in middle schools. The school organizes these core teachers into multidisciplinary groups and allows time for common planning. Furthermore, while the number of intervention teachers at Somerset Intermediate is lower than what would be recommended by the EB model based on the school's size, the school's provision of interventions for core subjects does demonstrate a focus on proficiency in core subjects.
3. Organizing teachers into collaborative groups. Teachers at Somerset Intermediate work in teams that contain an English/language arts teacher, a mathematics teacher, a science teacher, a social studies teacher, and, in some cases, a special educator. These teacher teams have common planning time and meet regularly. The school also has weekly after-school professional development sessions, wherein content-area teachers regularly meet.
4. Data-based decision making. Teachers at Somerset Intermediate regularly review student performance and use that information to inform curriculum and instruction. Use of information related to student performance exists across disciplines, but it is especially prevalent for English/language arts and mathematics, where instructional coaches work with teachers to identify patterns in student performance within and across classes.
5. Extra help for students at risk of academic failure. Somerset Intermediate provides several supports for students at risk of academic failure. Academic supports include special educators who co-teach in the general education program, special education aides working in the general education program, and English/language arts and mathematics intervention periods within the

school day. Behavioral supports include student access to programs and personnel geared toward ensuring that students have emotional support in the school environment.

6. Instructional leadership that penetrates all levels of the system. Somerset Intermediate employs two instructional coaches. These coaches work to support the implementation of the English/language arts and mathematics curricula in the school. Because they do not have teaching assignments, they are able to spend their time mapping curriculum, creating assessments, analyzing student data, and supporting teachers.

Somerset Intermediate leverages its resources to focus on the core instructional program while providing a streamlined elective program for students. The school couples the instructional program with academic and behavior supports for students at risk of academic failure and a commitment to a collaborative teaching environment. In these and other ways, the school demonstrates an alignment with the EB model and an effort to use resources thoughtfully.

Chapter XIII: Wiley H. Bates Middle School Case Study Report

Prepared for
The Maryland State Department of Education
Study of Adequacy of Funding for Education in the State of Maryland

By

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Executive Summary

Wiley H. Bates Middle School is an example of the third category of schools – a school generating significant growth among student subgroups over time.

Wiley H. Bates Middle School, located in Annapolis, is an arts integration school that also contains a performance and visual arts magnet program. In fall 2014, the school enrolled 800 students, and school staff reported serving 881 students in early 2015. In 2014, 45.6 percent of students at Bates were eligible for free or reduce-priced meals (FRPM), 10.2 percent were limited English proficient (LEP), and 8.5 percent were special education students. The student body at Bates is racially and ethnically diverse. In 2014, 53.1 percent of students were ethnic minorities, with 27.5 percent African American and 25.6 percent Latino. White students constituted 39.6 percent of all students.

Between 2007 and 2012, Bates demonstrated substantial improvement in the performance of four subgroups of students: 1) FRPM-eligible students, 2) LEP students, 3) special education students, and 4) non-Asian/non-white students. For instance, from 2007 to 2012, the percentage of students who scored either proficient or advanced in reading, math, and science increased:

- 30 percentage points for FRPMs students (34.3 to 64.3 percent);
- 19 percentage points for LEP students (9.9 to 28.8 percent);
- 36 percentage points for students with special needs (12.9 to 48.8 percent); and
- 29 percentage points for students whose race/ethnicity is not white or Asian (36.8 to 66.0 percent).[59]

Interviews with staff members at Bates and reviews of documents related to Bates suggest that a number of factors contributed to these gains. These factors are associated with significant instructional resources. They include:

1. A large instructional staff. Bates has the resources to maintain a large instructional staff, including teachers of core subjects, teachers of elective subjects, special education teachers, and teachers of LEP students. The ability to maintain this staff allows the school to have:
    a. Small homerooms and core classes;
    b. ample release time for teacher planning;
    c. common release time for collaborative planning; and
    d. multiple educators who can support students at risk of academic failure.

[59] Percentage point calculations are based on unrounded numbers.

2. Multiple instructional coach positions. Bates employs several instructional coaches, including a school improvement coach, a literacy coach, an arts integration specialist, a novice teacher mentor, and department chairs in English/language arts, mathematics, science, social studies, and special education. Because these instructional coaches do not have teaching responsibilities, they can focus their efforts on supporting teachers, which they do in a variety of ways.
3. Arts integration and performance and visual arts magnet programs. Bates encourages student participation in the arts through whole-school arts integration and through a specialized performance and visual arts magnet program. Since the introduction of the arts focus at Bates, the school has had access to a number of continued supports that maintain a strong commitment to the arts, such as arts-centric professional development and the presence of an arts integration specialist. School staff report that a focus on the arts has improved outcomes for students at Bates by providing students with multiple ways to learn and master course content and providing students with common experiences that unify them and give them a sense of belonging.
4. Control over hiring. School administration reports that it has significant control over which prospective employees will be offered a job at Bates. Accordingly, school administrators are able to select staff members who will participate meaningfully in collaborative planning sessions, embrace the arts focus of the school, and engage in other behaviors that school administrators deem priorities at Bates.
5. Committed and relationship-driven staff. One of the priorities for Bates administrators is the willingness of staff members to create and maintain positive relationships with each other, with students, and with the community at large. Perhaps due, at least in part, to significant school-level control over hiring, staff members throughout the school report that they are committed to the mission of the school and want to build relationships that will foster a positive learning community.

Introduction

Wiley H. Bates Middle School, located in Annapolis, is one of 19 middle schools in Anne Arundel County Public Schools (AACPS). The school, which sits next to the Maryland Hall for the Creative Arts, practices an arts integration model wherein teachers of all subjects infuse their lessons with arts curriculum and instruction. Accordingly, throughout the day, students at Bates are exposed to instruction in core subjects as well as an array of arts disciplines.

Students at Bates come from a variety of backgrounds. According to staff members at the school, Bates students come from low-income, middle-class, and wealthy homes. Some parents do not work outside the home, and others work in a range of other occupations, including in the military (some of whom work at the nearby U.S. Naval Academy), in vocational fields, and in professional fields such as education and healthcare.

School staff reports that as of spring 2015, Bates served approximately 881 students. According to staff, students at Bates are organized into one of three grade-level homerooms: 302 students are in grade six homerooms, 300 students are in grade seven homerooms, and 259 students are in grade eight homerooms. About 20 students are in mixed-grade homerooms. Mixed-grade homerooms are for students with individualized education plans (IEP) who participate in specific special education programs at the school. These include a program for students with emotional disabilities, a Functional Life Skills program, and a High Roads program. Table 1 presents average class sizes based on the approximate number of students in each type of homeroom and the number of homerooms of each type.

Table 1
Wiley H. Bates Middle School Class Sizes

Grade-Level	Class Size
Six (20 homerooms)	15
Seven (20 homerooms)	15.1
Eight (17 homerooms)	15.2
Mixed (3 homerooms)	6.7

Source: Personal communication with school staff.

In addition to integrating art instruction into classes across the curriculum, Bates has a magnet program for performance and visual arts. According to school staff, approximately 40 percent of the school's students are enrolled in the performance and visual arts magnet program. The magnet program draws students from both within and outside the school's typical catchment area. School administrators estimate that about 150 students (17.0 percent) live out of the school's catchment area.

The student population at Bates is diverse (Table 2). In 2014, the majority of students were minorities – African American (27.5 percent) or Latino (25.6 percent) – with the remaining students being white (39.6 percent). Just under half (46.5 percent) of Bates students were eligible for FRPM. Smaller proportions of the student body were LEP (10.2 percent) or special education (8.5 percent).

Table 2
Wiley H. Bates Middle Student Characteristics, 2014

Student Characteristics	Percentage of Bates Student Population
Race/ethnicity	
American Indian/Alaska Native	-
Asian	2.4
Black/African American	27.5
Hispanic/Latino	25.6
Native Hawaiian/Pacific Islander	-
Two or more races	4.3
White	39.6
Students eligible for free or reduced-price meals (FRPM)	46.5
Limited English Proficient (LEP) students	10.2
Special education students	8.5

A "-" indicates either no students or the number of students was suppressed due to too few students in the category.
Source: Maryland Report Card (www.mdreportcard.org).

School staff highlighted two noteworthy changes in student enrollment over the past several years. First, the total enrollment of the school has grown. For instance, according to data from the Maryland Report Card, student enrollment grew from 644 in 2011 to 800 in 2014, and school staff report a total of 881 students in spring 2015. Second, the number and proportion of Latino students in the school has increased. Specifically, according to data from the Maryland Report Card, Latino enrollment increased from 119 students in 2011 (18.5 percent) to 205 students in 2014 (25.6 percent).

Student Performance

In recent years, student performance on the Maryland School Assessment (MSA) has improved at Bates (Table 3). Overall, students' achievement on the MSA improved by more than 25 percentage points between 2007 and 2012. Gains in student performance for subgroups of students (such as FRPM students, LEP students, special education students, and students whose race/ethnicity is not white or Asian have been particularly noteworthy.

For instance, from 2007 to 2012, the percentage of students who scored either proficient or advanced in reading, math, and science increased:

- 30 percentage points for FRPM students (34.3 to 64.3 percent);
- 19 percentage points for LEP students (9.9 to 28.8 percent);
- 36 percentage points for special education students (12.9 to 48.8 percent); and
- 29 percentage points for students whose race/ethnicity is not white or Asian (36.8 to 66.0 percent).[60]

Table 3
Wiley H. Bates Middle School Performance, Maryland School Assessment (MSA), 2007-2014

Average School-Wide Percent Scoring Proficient/Advanced in Reading, Math and Science								
Performance Level	**MSA 2007**	**MSA 2008**	**MSA 2009**	**MSA 2010**	**MSA 2011**	**MSA 2012**	**MSA* 2013**	**MSA* 2014**
All Students	53.3	63.4	65.6	67.1	75.3	78.6	78.0	70.4
Free and Reduced-Price Meals (FRPM) Students	34.3	51.0	53.0	53.2	64.1	64.3	NA	NA
Limited English Proficient (LEP) Students	9.9	13.7	17.6	19.0	32.5	28.8	NA	NA
Special Education Students	12.9	27.0	30.1	24.3	43.0	48.8	NA	NA
Non-white/Non-Asian Students	36.8	49.8	54.4	54.1	64.5	66.0	NA	NA

*Assessment data by student subgroup for 2013 and 2014 were not available at the time this report was written.
Source: Data provided by the Maryland State Department of Education (MSDE).

A number of staff members attribute these gains in achievement, at least in part, to particular curricular, instructional, and other resources. For instance, staff members express that the school's arts integration model and the performance and visual arts magnet program are key ingredients in the improvement of student outcomes at Bates. Teachers also attribute student achievement gains to the availability of

[60] Percentage point calculations are based on unrounded numbers.

collaborative planning time for teachers, who work together to create curricular and instructional strategies that they think will be most beneficial for their particular students.

This case narrative explores these and other resources that have been integral to improving student achievement at Wiley H. Bates Middle School. The case has 11 sections: 1) school performance, 2) school staffing, 3) school goals, 4) school schedule and collaborative planning time, 5) curriculum and instructional program, 6) assessments, 7) extra help for students at risk of academic failure, 8) professional development, 9) school culture and leadership, 10) summary and challenges, and 11) the degree of alignment between the school's strategies and the school improvement strategies embedded in the EB Funding Model. These sections draw upon information from two main sources: a review of documents provided by school officials or available online, and individual and focus group interviews held in late January 2015 with school staff, including school administrators, instructional staff, and support staff.

School Staff

In 2008, after failing to meet adequate yearly progress goals for several years, Bates was restructured. As part of the school restructuring process, the arts integration model was introduced at the school and many members of the school staff were replaced. At that time, the school experienced a high level of turnover. New staff and those who remained at the school were committed to the school and its new arts integration mission.

In the years following the formal restructuring process, the school has experienced some degree of staff turnover. The principal who was in place after the restructuring process left the school, but was replaced by another administrator from within the building. Staff members estimate that the school needs to fill about 15 to 20 positions a year. Staff members perceive that these positions become open due to promotions of Bates staff to leadership positions across the district.

The school administration reports that it has substantial control over hiring. School administrators look for prospective employees who are willing to:

- Collaborate with colleagues;
- adopt data-driven instruction;
- implement arts integration;
- participate in a relationship-driven culture;
- run a classroom where the instructional and classroom expectations are clear;
- put students at the center of teaching and learning;
- integrate reading and writing strategies across content areas to meet state standards;
- engage with the community on and off campus;
- demonstrate a visible passion for learning; and
- achieve professional growth.

According to a school administrator, the school prioritizes these 10 qualities in discussions with applicants for open positions and has the authority to select candidates whose preferences and experiences align with these qualities.

Bates employs a large staff that includes several instructional positions as well as a number of support staff for both teachers and students. Table 4 provides an overview of the school's staff by full-time equivalent (FTE) position for the 2014-15 school year.

Table 4
Staffing in Wiley H. Bates Middle School, 2014-15

Category	FTE
Administration	
Principal	1
Assistant Principal	3
Clerical, Business, and Technical Support	9
Main Program	
Core Teachers	41.5
Elective Teachers	14.3
Instructional Coaches	8.8
Special Education Self-Contained	7
Special Education	8
LEP Teachers	3
Permanent Substitute	1
Aides	
Instructional (Media/Library Room)	1
Special Education (Self-Contained)	1
Pupil Support	
Guidance Counselor	3
Nurse	1
Psychologist	1
Social Worker	0.8
Speech Therapist	1
Other Pupil Support	4
Cafeteria Staff	5
Custodians	8

In addition to the compensated staff listed in Table 4, cadets from the U.S. Naval Academy volunteer as tutors for students at the school.

The school employs a large instructional staff that includes 41.5 FTE teachers of English/language arts, mathematics, science, social studies, Spanish, and Italian. The average class size of these core classes is approximately 21 students. The Bates staff also includes 14.3 FTE elective positions and an instructional aide in the library. This instructional staff implements the arts-integrated core and elective program as well as the performance and visual arts magnet program.

A cadre of school leaders supports the work of teaching and learning at Bates. Each of the school's three assistant principals works closely with one grade-level and follows students as they progress through the school so that students receive support from the same administrator for three years. Bates also has almost nine instructional coach positions. These include a school improvement coach, who analyzes student achievement data and supports teachers in implementing the school improvement plan; a literacy specialist, who works with teachers in all disciplines to incorporate strategies to help students develop strong literacy skills; department chairs in English/language arts, mathematics, science, social studies, and special education; a 0.8 FTE arts integration specialist; and a Right Start advisor, who mentors novice teachers. These instructional leaders do not have teaching loads, allowing them to focus their time and energy on supporting teachers and their instructional programs.

Several specialized educators work at Bates in a variety of capacities. Seven special educators work with higher-needs students who participate in self-contained programs for at least part of the day. The most intensive of these programs is the Functional Life Skills program, which helps students with severe and profound disabilities gain important skills they need to navigate life in society. The Functional Life Skills program is entirely self-contained. The other two programs, one for students with emotional disabilities and another for students with a range of disabilities (called the High Roads program), provides students with targeted support for part of the day and receive instruction in the general education program for the remainder of the day. Eight special educators work within the general education program in order to provide students with disabilities the support they need for successful participation in the integrated environment. Six special educators (two in each grade) co-teach with general educators so that students have access to two teachers in the classroom setting. Bates also employs three LEP teachers who support the growing population of students for whom English is not a first language.

Bates is able to offer its students substantial non-instructional assistance through a team of pupil support personnel. The school employs three guidance counselors – one for each grade – and also has access to the expertise of a psychologist, a speech therapist, a nurse, and a social worker (who comes to the school four-days a week). Other pupil support personnel include behavior interventionists, an educator who works with traditionally underserved potential college enrollees, and a pupil personnel worker who helps to ensure that students are not absent from school.

In sum, Bates has significant human resources for supporting its instructional program. Notable among these resources are: 1) an adequate number of teachers needed to offer small class sizes and provide time for common planning; 2) sufficient administrators to provide school-wide support as well as targeted grade-level support; 3) a team of instructional coaches for providing curricular and instructional

support throughout the building; 4) several special educators and LEP teachers for providing extra assistance to those students with unique challenges in the classroom; and 5) a team of staff members who support students' socio-emotional well-being and ensure that students are emotionally equipped to participate in a learning environment.

School Goals

The Bates school improvement plan incorporates the goals outlined in the AACPS strategic plan. These goals provide broad objectives that all schools in the district must achieve. They include:

- 50 percent of all students in each student group in grades three through eight will be performing at the advanced level on the MSA in reading and math;
- 80 percent of all students in each student group will have completed at least one world and classical language course by the end of their grade eight year;
- 80 percent of all secondary students in each student group will receive fewer than two [disciplinary] referrals;
- 95 percent of all secondary students in each student group will receive fewer than six [disciplinary] referrals; and
- 90 percent of all secondary students in each student group will not be suspended from school.

In recent years, the school has focused its school improvement plan on specific academic and behavioral goals. For example, to ensure that students will be able to understand content well enough to achieve advanced performance, academic goals include a focus on depth of knowledge rather than breadth of content coverage. For the past few years, the school has placed an increased emphasis on literacy and has incorporated literacy across content areas. Amid the transition to the Maryland College and Career-Ready Standards and given the emphasis that the Partnership for Assessment of Readiness for College and Careers (PARCC) assessment places on writing, the school has incorporated Common Core-aligned math practices into mathematics instruction and emphasized writing across the curriculum.

Not all goals are strictly academic. Rather, some goals pertain to student behavior and how the school responds to behavioral issues. A consistent theme that arose in conversations with school staff was the prioritization of building strong relationships among staff members, and between staff and students. This focus on relationship-building, paired with a number of behavioral interventions (discussed in more detail below), are the means through which school staff aims to address behavioral goals.

School Schedule

Students start the day at 8 a.m. with a 20-minute homeroom/breakfast period. The instructional day includes six 55-minute periods. One period includes an extra 25 to 30 minutes for lunch and the last period includes an additional nine minutes for closing announcements. Twice a week classes are shortened by approximately five minutes each to provide time during the school day for an additional class period. The school uses these two additional classes to provide interventions for students at risk of academic failure. Students who do not need academic interventions use this time for independent

activities, such as recess. The students' school day ends at 2:50 p.m., and after-school activities take place from 3 to 4:30 p.m.

Each day, students attend four core classes (English/language arts, mathematics, social studies, and science) and two elective classes. In general, school administrators assign students to classrooms such that the classes contain students from a variety of ability groups. Within these heterogeneous groupings, administrators make sure that each class contains a larger number of high-performing students than students who struggle with the content. In mathematics, administrators assign one group of students to classes that cover above-level content and another group of students to classes that cover on-level content. Students in the performance and visual arts (PVA) magnet program, who have two hours of PVA content every other day, participate in core curriculum with non-magnet students.

Teachers have four classes of students per day and two daily planning periods – one for individual planning and one for collaborative planning. The section on professional development later in this report describes teachers planning period schedules in more detail.

Curriculum and Instruction

Curriculum

Teachers follow the AACPS district curriculum for the core subjects of English/language arts, mathematics, science, and social studies. The school also offers two world languages. Spanish is offered to all students in the school and Italian is available to students in the performance and visual arts magnet program. The school supplements its core instructional program with several electives. Elective offerings include creative writing, physical education, technical education, media education, band, chorus, music, dance, and art (for both the entire school and the performance and visual arts magnet). Many of these elective offerings reflect the arts focus of the school.

Teachers at Bates receive core curricular materials from the district and follow district guidelines regarding when to introduce particular content. Teachers from all core areas, however, report that they supplement district materials with content that they gather from outside sources. In English/language arts, teachers supplement district content with material from Holt McDougal's Teacher One Stop. They also use Scholastic Scope (which consists of magazines and online readings) and other materials that the English/language arts department chair or teachers have found. In mathematics, teachers supplement district materials with Carnegie MATHia software, which allows students to access instructional materials and practice problems. In science, teachers supplement district materials with content from online tools such as Explore Learning, the Science Spot, Science-Class.net, and MiddleSchoolScience.com. Social studies teachers often collaborate with each other to find supplemental materials from a variety of outside sources. Across multiple disciplines, teachers report that they use Edmodo, an online community of educators, to gather curricular resources.

Many resources support the curricular program at the school. In addition to curricular resources such as district curriculum pacing guides, teacher texts, and student texts, teachers at Bates have access to strategically allocated planning time. Teachers use common planning time to meet with their departmental peers and discuss curricular matters. During these meetings, teachers share content that they gather from outside sources. They also work together to plan lessons that will be consistent across sections of the same grade and vertically aligned across grades. They create common assignments and analyze student performance on these assignments to decide when they need to spend more time on certain parts of the curriculum and when and how they should advance to new parts of the curriculum.

Instruction

According to school staff, teachers at Bates use a variety of instructional strategies to help students master the curriculum. The most consistent theme in discussions with school staff about instruction was that arts integration strategies pervade the building and teachers report that the infusion of a variety of arts disciplines (including but not limited to visual arts, music, and dance) into core disciplines allows students to understand core concepts more deeply. Teachers use integrated lessons to teach, and when necessary, re-teach core content material to students. For instance, a lesson where students used lines with different line weights to represent slopes of algebraic equations is used to teach students content in both visual arts and mathematics.

Beyond arts integration, teachers throughout the school report using warm-ups to start lessons and closing activities to end lessons. Many teachers report relying on visual aids and graphic organizers to convey material, which they perceive to be particularly helpful for LEP and special needs students.

Assessments

Staff members at Wiley H. Bates use a variety of assessments to measure students' proficiency. First, the school uses commercially available assessments, such as the Gates-MacGintie reading test and the WIDA ACCESS test of English language proficiency. Second, the school administers state assessments. Through the 2013-14 school year the State administered the MSA. Beginning in 2014-15, the State will administer the new Partnership for Assessment of Readiness for College and Careers (PARCC) assessment, which is aligned with the Common Core standards. Third, in both English/language arts and mathematics, teachers use district-created unit assessments. Finally, in all core subjects, teachers use collaborative planning time to create common assessments to supplement the district-provided assessments.

In concert with the school improvement coach and department chairs, teachers continuously review student data from this suite of assessments. Staff at Bates use information from the Gates-MacGintie and WIDA ACCESS tests to place students in classes or interventions. Teachers use data from district and in-house assessments to determine how to group and re-group students within classrooms. They also use these data to identify which content seems to be the most challenging for students and to gauge whether or not they need to re-teach any content in order to ensure that students have a deep understanding of course material. According to school leaders, while school staff look at the

achievement of all students, they pay particular attention to how students with special needs perform on state, district, and in-house assessments, and attempt to identify and address gaps between these students and other students in the school.

The use of assessments and resulting data to inform instruction at Bates requires a variety of resources. These include staff access to the assessments themselves and/or time to create in-house common assessments. Further, the school improvement coach serves as a significant resource in the process of identifying patterns in student assessment data and making sense of how to use data to meet specific school goals. Additionally, teachers need time to review their students' data and to discuss how trends in the data will impact their curricular and instructional plans going forward.

Interventions

Wiley H. Bates Middle School uses several strategies to help students succeed. Some of these strategies are aimed at improving students' academic outcomes, while other strategies are aimed at improving students' behavioral outcomes.

Academic Interventions

Bates began implementing an Intervention and Independence (I & I) program in the 2014-15 school year. Two days a week, the school shortens classes by five minutes to make time for an extra 40-minute class period. School staff use this extra 40-minute period to provide interventions to students who have a grade of 75 or below in a core class. While teachers in mathematics select their own materials for these intervention periods, staff at Bates use externally developed intervention packages for English/language arts. These programs include the McDougal Bridges to Literature program, the Wilson Reading System, the Soar to Success Reading program, and the Corrective Reading program.

Formal intervention for Bates students also exists outside the traditional school day. After-school twice a week, the school holds Help Day, where students can receive tutoring, make up missed work, or engage in other instructional activities. The school staff also reports that, during the summer, Bates students participate in a district-run mathematics program called Summer Bridge. The program is open to students throughout the district, but it is convenient for Bates students to attend because the district uses the Bates school facility as one of the program's sites.

Bates also uses a number of informal strategies to help students at risk of academic failure. School staff members report that many teachers spend their lunch hours tutoring and mentoring students and that department chairs sometimes also tutor students, if needed. Additionally, some school staff volunteer at the community Boys and Girls Club to help students with their homework.

Behavioral Interventions

A consistent theme at Bates was the notion that staff work hard to establish relationships with students and their families. The relationship-driven environment reported by staff is the foundation upon which more formal behavioral supports reside.

Bates staff members rely on three formal strategies to support positive behavior (and attempt to prevent the need to address negative behaviors). The first of these supports is the CHAMPS (Conversation, Help, Activity, Movement, Participation, and Success) system. The CHAMPS system provides school staff with a common and consistent language to talk about standards of appropriate behavior that is school-wide. The second is the Positive Behavioral Interventions and Supports (PBIS). Through the PBIS system, school staff members reward students when they demonstrate positive behavior, and students who earn enough rewards can participate in special events coordinated by teachers and other staff members. The third support, Community First, is new this academic year (2014-15). If students do not have course grades and therefore cannot be assigned to an Intervention and Independence period during the first marking period, they are required to participate with their homerooms in Community First, a program that promotes community and school values.

Bates addresses negative behavior in a variety of ways. As noted above, the school employs several counselors, a psychologist, a social worker, and other student behavior support personnel. These staff members consistently provide support to students who may struggle to behave appropriately in an educational setting. Additionally, the school houses a "decision-making room," where students who become angry or engage in problematic behavior can go to calm down and reflect on their actions. Staff members throughout the school mentor students with discipline issues. This involves a formal "check in, check out" relationship so that students who have trouble with discipline have a daily opportunity to interact with caring adults. A small number of staff members have been trained to conduct restorative justice circles with students, wherein students who have committed an offense meet with those who have been wronged in order to repair the broken relationship. Finally, in an effort to reduce loss of instructional time, Bates uses Saturday school as an alternative to suspensions when students do engage in behavior that merits suspension.

Professional Development

Teachers at Wiley H. Bates have access to several professional supports. One major source of professional support for Bates teachers is daily individual and collaborative planning time. Every teacher has two planning periods every day. One of the periods is reserved for individual planning, while the other period is reserved for collaboration with other educators in the building. Three times every week, teachers use the collaborative planning time to work with colleagues in cross grade-level department teams. Once a week, the meeting is used as either a targeted professional development session or a collaborative decision-making session. The targeted professional development sessions are often focused either on literacy, given the school's goal to incorporate a focus on literacy into all academic areas, or about the arts, given the school's arts integration mission. The collaborative decision-making sessions typically provide time for multiple staff members to discuss the supports they can provide to particular students who are struggling academically or behaviorally. Teachers use the final collaborative planning time each week to meet with their grade-level peers who work across a variety of subjects.

In addition to the professional development sessions that are embedded in the week during common planning periods, teachers at Bates have access to two other types of professional development. First, the district has one early dismissal professional development day each month. Bates staff members typically use this professional development time to focus either on arts integration or on a goal from the school improvement plan. Second, teachers report that the school supports their engagement in additional, outside professional development opportunities and pays for them to attend these opportunities.

Bates employs several instructional coaches who provide consistent support to teachers both within and outside these formal times for collaboration and development. Because the school improvement coach, literacy coach, arts integration specialist, and department chairs do not teach, they are able to focus their efforts on supporting teachers. The school improvement coach monitors student achievement and provides assistance to teachers as they analyze student data and determine how to use those data to inform practice. The school's Right Start advisor mentors first-year teachers and provides instructional support to second-year teachers. The other instructional leaders help teachers plan lessons, provide materials and content for lessons, mentor new teachers, and team-teach. Department chairs often informally observe teachers' lessons. The staff reports that teachers welcome feedback on their practice based on these informal observations. Typically, the department chairs will provide teacher-specific feedback only to the teacher and not to others, such as school administrators.

As the preceding paragraphs make clear, Bates has access to several resources that support teachers' work and encourage their professional growth. Bates is able to provide teachers with ample planning time due to the fact that it employs enough teachers to make school-embedded release time possible. School administrators are intentional about how they organize teachers for instruction and schedule students into classes so that teachers can use their planning time to collaborate with their colleagues and engage in professional development activities. The school employs several non-teaching instructional coaches who are able to provide continuous support to teachers. In conversations with researchers, school staff members repeatedly attributed school success to the existence of collaborative planning time and to the substantial support they receive from the many instructional coaches throughout the building.

School Culture

Staff members report that the while the school restructuring process that took place several years ago was very challenging, the process ensured that staff members who stayed and those new to the school committed to Bates and its arts integration mission. Staff members also report that the introduction of arts integration and the performance and visual arts magnet, which occurred close to the time of the staff restructure, also changed the culture of the school by providing a unifying vision.

School administrators place high value on strong relationships and, as noted above in the section on school staffing, make hiring decisions based in part on employees' willingness to engage in a relationship-driven environment. Use of relational language and discussions of support permeates staff

discourse. According to school staff, the school culture is built on strong relationships among staff members; among students; and between staff members and students, their families, and the community at large.

Strong relationships among staff members lead to a culture of encouragement and reflection. According to school staff, teachers regularly work together, support each other, and assist each other. School staff report that activities such as common planning and informal observations by instructional coaches lead to trusting relationships that foster an environment where teachers feel safe enough to reflect on their practice, be creative in instructional approaches, and share their successes and struggles with each other.

Building strong relationships among students is also an important part of the Bates culture. Teachers report that students feel connected to the school and that the school is a safe place for them to be. Because the school contains a regional magnet program, the school attracts students from a variety of backgrounds. Staff members report that a number of factors contribute to an environment where students from all backgrounds feel like a united student body. First, the staff reports that the arts integration focus unifies the school. Regardless of whether they are part of the magnet program, students have regular access to the arts. Both day-to-day and special art experiences provide common ground for students. Second, staff members report that they work to instill a common set of values in all students so that everyone feels connected to the Bates community. Finally, students at Bates are required to wear uniforms, which the staff perceives to foster a sense of cohesion.

School staff members state that they work hard to cultivate caring relationships between staff and students at Bates. Teachers report that they devote substantial time, during class time, during lunchtime, and outside of school hours, to providing students the support they need to succeed. The school administration invites parents to come to the school and engages with families regarding their children's education. School staff members describe ways that they try to extend these relationships beyond the school walls. For instance, they volunteer in the community to show their support for the students, they run a food pantry for families at the school, and they go into the community to engage with parents in settings that are comfortable to them.

Summary

Wiley H. Bates Middle School has demonstrated substantial improvement in the performance of four subgroups of students: 1) low-income students, 2) English language learners, 3) special education students, and 4) non-Asian/non-white students. The preceding sections, based on information gathered through interviews with staff members at Bates and reviews of documents related to Bates, suggest that these gains are associated with the strategic use of instructional resources. They include:

1. A large instructional staff. Bates has the resources to maintain a large instructional staff, including teachers of core subjects, teachers of elective subjects, special education teachers, and LEP teachers.

   a. The ability to maintain this staff allows the school to have:
   b. Small homerooms and core classes;
   c. ample release time for teacher planning;
   d. common release time for collaborative planning; and
   e. multiple educators who can support students at risk of academic failure.

2. Multiple instructional coach positions. Bates employs several instructional coaches, including a school improvement coach; a literacy coach; an arts integration specialist; a novice teacher mentor; and department chairs in English/language arts, mathematics, science, social studies, and special education. Because these instructional coaches do not have teaching responsibilities they can focus their efforts on supporting teachers, which they do in a variety of ways.

3. Arts integration and performance and visual arts magnet programs. Bates encourages student participation in the arts through whole-school arts integration and through a specialized performance and visual arts magnet program. Since the introduction of the arts focus at Bates, the school has had access to a number of continued supports that maintain a strong commitment to the arts, such as ongoing arts-centric professional development and the presence of an arts integration specialist. School staff report that a focus on the arts has improved outcomes for students at Bates by providing students with multiple ways to learn and master course content and providing students with common experiences that unify them and give them a sense of belonging.

4. Control over hiring. School administration reports that it has significant control over which prospective employees will be offered a job at Bates. Accordingly, school administrators are able to select staff members who will participate meaningfully in collaborative planning sessions, embrace the arts focus of the school, and engage in other behaviors that school administrators deem priorities at Bates.

5. A committed and relationship-driven staff. One of the priorities for Bates administrators is the willingness of staff members to create and maintain positive relationships with each other, with students, and with the community at large. Perhaps due, at least in part, to significant school-level control over hiring, staff members throughout the school report that they are committed to the mission of the school and want to build relationships that will foster a positive learning community.

Alignment with the Evidence-Based Model

There are many ways in which the resources at Wiley H. Bates Middle School align with and, in some cases exceed, the recommendations in the evidence-based (EB) model.

First, in recent years, the school adopted an arts integration focus and started a magnet program for the performance and visual arts. These changes provided a foundation for change in the school. At this time, school staff attributes many student successes to a consistent, school-wide commitment to using the arts to improve instruction in all content areas. School administrators report that they have significant

control over hiring and are able to select prospective employees who are committed to the school and its unique mission.

Additionally, Bates has taken an intentional approach to creating a collaborative environment among its instructional staff and has a number of resources that support this approach. The Bates staff includes a higher percentage of elective teachers than is recommended by the EB model (20 percent for middle schools). This high proportion of elective teachers allows for the incorporation of two teacher planning periods per day. Because of this large teaching staff and the strategic organization of teachers and students, teachers at Bates have daily opportunities to collaborate with their peers. Teachers meet with their departmental colleagues three times a week and with their grade-level colleagues once a week. They use collaborative planning time to plan lessons, create common assessments, share course content, and discuss successful instructional strategies for students.

Bates also supports teachers' professional growth, both within and outside of this collaborative planning time. The school has one instructional coach per 100 students, which is a smaller ratio than the EB recommendation of one coach per 200 students. These instructional coaches support the work of teacher teams and provide teachers with targeted assistance. With support from the school improvement coach, teachers analyze student achievement results and use that information to make decisions about how to approach lessons. Department chairs, the arts integration specialist, the literacy coach, and the new teacher mentor provide teachers at Bates job-embedded professional development, and teachers are encouraged to pursue outside professional development opportunities that will help them promote student success.

Finally, the school maintains an average core class size of 21, which is lower than the EB recommendation of 25 students. The school also provides multiple additional supports to help students who may need additional assistance in the classroom. Bates employs a number of LEP and special education teachers. Six special educators co-teach with general education teachers to ensure that students have access to multiple educators in the regular class setting. Additional supports for students who are struggling academically include interventions provided twice a week during the school day or tutoring at lunchtime and after-school.

Gains in student achievement and a positive school climate suggest that the staff at Wiley H. Bates Middle School has been able to leverage its resources to help students succeed. By investing in arts integration, securing many teaching and instructional coach positions, and being intentional about the use of time, Bates has been able to work toward meaningful school improvement.

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Those with an asterisk * refer to randomized controlled trials.

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Appendix A

Glossary of Funding Model Elements

Model Element	Definition
Core Teachers	Core teachers are the grade-level classroom teachers in elementary schools and the core subject teachers in middle and high schools (e.g. mathematics, science, language arts, social studies and world language, including such subjects taught as Advanced Placement in high schools). Core teachers are provided at the rate of one for every 15 K-3 students and one for every 25 grade four to 12 students.
Elective Teachers	Elective teachers are all teachers for subject areas not included in the core, including such classes as art, music, physical education, health, and CTE, etc. However, some CTE classes can substitute for core math and science classes. Elective teachers are provided at the rate of 20 percent of core teachers for elementary and secondary and 33⅓ percent of core teachers for high schools.
Instructional Coaches	Instructional coaches (sometimes called mentors, site coaches, curriculum specialists, or lead teachers) coordinate the school-based instructional program, provide the critical ongoing instructional coaching and mentoring that the PD literature shows is necessary for teachers to improve their instructional practice, do model lessons, and work with teachers in collaborative teams using data to improve instruction.
Tutors	Tutors, or Tier 2 Interventionists, are licensed teachers who, during the regular school day, provide one-to-one or small group (no larger than five) tutoring to students struggling to meet proficiency in core subjects.
Extended day Programs	Extended day programs provide academic extra help to students outside the regular school day before and after-school.
Summer School	Summer school includes all programs provided during the summer months, i.e. outside the regular school year, largely focusing on academic deficiencies of students but includes a wider array of classes for high school students.
At Risk Students	The unduplicated count of FRPM-eligible students and all LEP students. The resources triggered by at risk student counts would include all resources for tutors (Tier 2

Model Element	Definition
	Interventionists), summer school, extended day programming, and additional pupil support.
English Language Learner Services	LEP students are those who come from homes where English is not the native language and who perform at Levels 1, 2, and 3 in English; in addition to the at risk resources, the model provides resources to provide ESL or other extra help services for these students.
Special Education	Programs for all students with disabilities.
Alternative Schools	Alternative schools provide services, usually outside of the regular school environment, to students who have some combination of significant behavioral, social and emotional issues often including alcohol or drug addiction. These students are different from at risk students and require a different set of services.
Gifted and Talented	Gifted and talented students are those who perform in the very top levels of performance and can handle much more than a year of academic work in a regular school year.
Substitute Teachers	These are regular substitute teachers.
Student Support, Guidance Counselors, Nurses	These include guidance counselors, social workers, psychologists, family outreach workers, nurses, etc. Guidance counselors and nurses are provided for all students, and additional student support staff are provided in the struggling student section.
Duty/Supervisory Aides	These are non-licensed individuals who help students get on and off buses, monitor the hallways, doors and playgrounds, and supervise the lunchroom.
Librarians	These are regular school librarians.
Principal, Assistant Principal	These are regular school principals and assistant principals.
Professional Development (PD)	PD includes all training programs for licensed staff in schools, including PD for implementing new curriculum programs, sheltered English instructional strategies for LEP students, gifted and talented, etc. It also includes assistance to teachers working in collaborative groups and ongoing coaching of teachers in their individual classrooms. Resources include instructional coaches, 10 pupil-free days for training, and $125 per pupil for trainers and other expenses.
School-Based Technology and Equipment	These include within school technology such as computers, servers, network equipment, copiers, printers, instructional software, security software, some curriculum management courseware, etc.

Model Element	Definition
Instructional Materials	These include textbooks, consumable workbooks, laboratory equipment, library books and other relevant instructional materials.
Interim, Short-Cycle Assessments	These include benchmark, progress monitoring, formative, diagnostic, and other assessments teachers need in addition to state accountability assessment data.
Student Activities	These include non-credit producing after-school programs, including clubs, bands, sports, and other such activities.
Central Office Administration	This is a per pupil amount developed for a prototypical school district of 3,900 students and includes all typical central office staff, such as superintendent, assistant superintendents, curriculum director, special education, business and HR functions, assessment and technology, and a director of operations/maintenance.
Operations and Maintenance	Covers functions such as custodial services, grounds maintenance and facilities maintenance, and minor repairs.

Maryland Education Funding Adequacy Study: Presentation to the Commission on Innovation and Excellence in Education

APA Consulting

Annapolis, MD

December 8, 2016

Today's Presentation

- Study overview
- Maryland's current education finance system
- Study recommendations and costs

Overview of the Adequacy Study

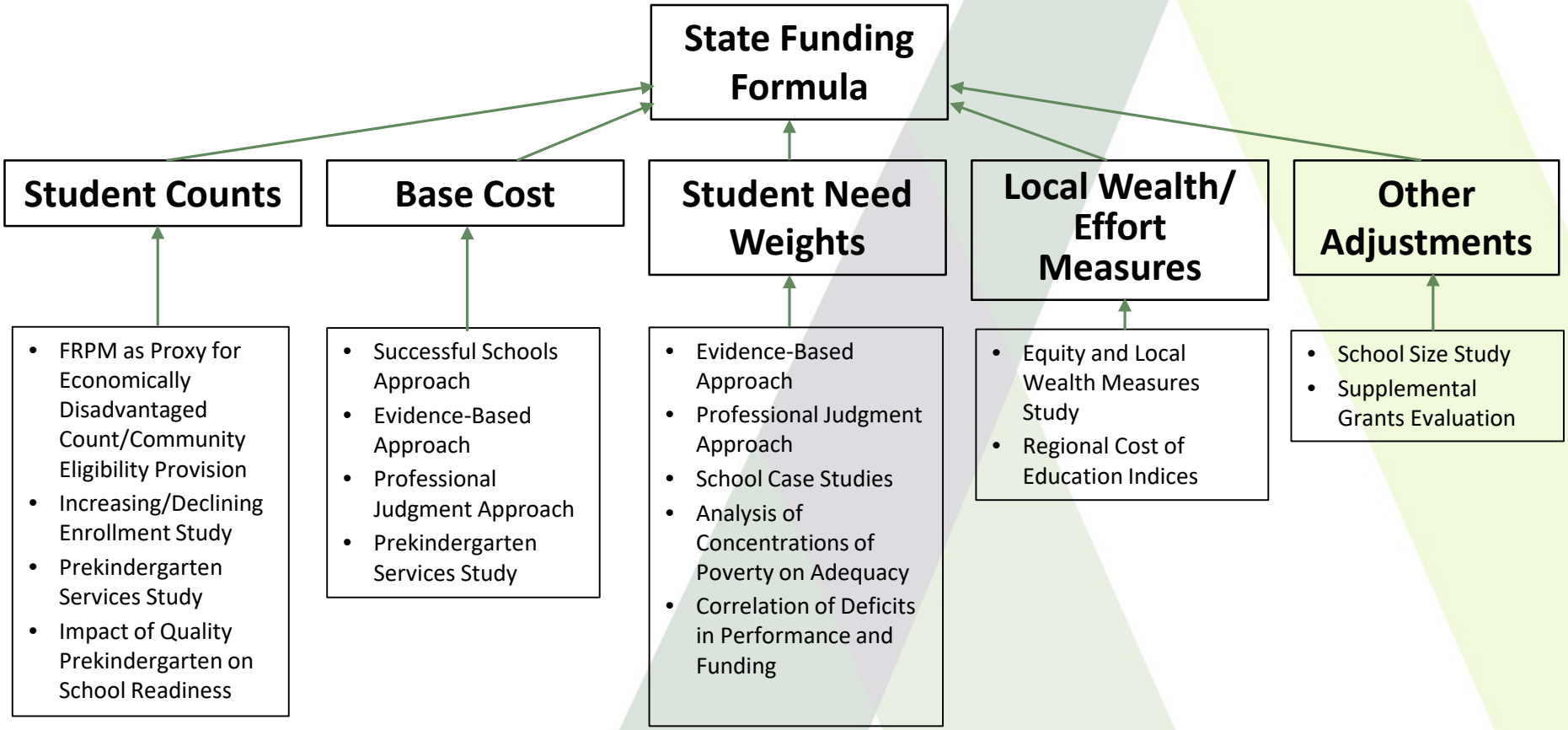
Study of Adequacy Funding for Education in Maryland

- This evaluation of the Bridge to Excellence in Public Schools Act was mandated as part of the Act's enacting legislation (Chapter 288, Acts of 2002)
- Focus is on reassessing the adequacy of the current foundation formula - per student base funding amount and weights for special needs students (compensatory, LEP, and special education)
- Adequacy considerations:
  - New state standards and assessments
  - Effects of concentrations of poverty
  - Achievement gaps
  - Impact of quality prekindergarten

Adequacy Studies

Preliminary Studies	Adequacy and Associated Studies	School Size Study	Other Requested Studies
Review of State Adequacy Studies Due August 2014	Evidence-Based Approach Due November 2016	School Size Study Final Report Due June 2015	FRPM as Proxy for Economically Disadvantaged Count/Community Eligibility Provision – Due June 2015
Case Studies of Improving Schools Due November 2016	Successful Schools Approach Due November 2016		Increasing/Declining Enrollment Study Due June 2015
Literature Reviews Multiple Reports and Due Dates	Professional Judgment Approach Due November 2016		Equity and Local Wealth Measures Study – Due September 2015
	Analysis of Concentrations of Poverty on Adequacy Targets Literature Review Due June 2015 Final Report Due November 2016		Prekindergarten Services Study Due September 2015
	Gaps in Growth and Achievement Among Student Groups Due November 2016		Regional Cost of Education Indices Final Report Due June 2016
	Correlation of Deficits in Student Performance and Funding Due November 2016		Supplemental Grants Evaluation Due October 2016
	Impact of Quality Prekindergarten on School Readiness Due November 2016		
	Other Factors in Adequacy Cost Study Due November 2016		
Technical Assistance			

How Studies Contribute to Maryland State Formula Update



Background Studies: Review of State Adequacy Studies, Literature Reviews, Gaps in Growth and Achievement Among Student Groups, Other Factors Affecting Adequacy

Adequacy Study

Utilized three approaches for estimating adequacy:

1. Evidence-Based (EB):
   - Adequacy estimated by costing out research-based strategies and programs
   - Used for estimating a per student base cost and special needs weights
   - State context incorporated through professional judgment panels and case studies of high performing schools
2. Professional Judgment (PJ):
   - Adequacy estimated via expertise of education professionals
   - Used for estimating a per student base cost and special needs weights
   - Employed total of nine professional panels (school level (4), special needs (2), district level, CFO, and state level)
3. Successful Schools (SSD):
   - Used for estimating a per student base cost
   - Measures spending levels of existing successful schools in State
   - Conducted at school level due to small number of districts

Evidence-Based Approach

- Evidence-based approach overview
  - Uses results of research, best practices, and case studies to identify elements of prototypical schools at each level (elementary, middle, and high) and district central office functions

Evidence-Based Approach

- Consists of three main components of work:
  - Develop a conceptual model of effective schools using literature from research and best practices
  - Then, modify conceptual model for Maryland context via:
    - Four EB panels comprised of educational practitioners who review the draft conceptual model to ensure that the EB recommendations reflect the needs and concerns of Maryland educators
    - A set of 12 case studies of high-performing or improving Maryland schools with which to compare the EB model and to identify effective programs currently being used in the state.

Evidence-Based Approach

- Study team worked with MSDE to identify 76 educators to serve on four panels held around the state. Each panel included:
  - District and school administrators, teachers (from all school levels, classroom & special needs), teacher leaders, school board members
- The panels were facilitated by study team researchers
- Panelists were provided with copies of the draft EB report and state standards/performance expectations for review prior to their meetings

Evidence-Based Approach

- The four EB panels were held in June 2016:

Date	Region	Location
June 23, 2015	Eastern Shore	Washington College 300 Washington Ave. Chestertown, Maryland
	Western Maryland	Allegany College of Maryland 12401 Willowbrook Rd. Cumberland, Maryland
June 24, 2015	Northern Maryland	Harford Community College 401 Thomas Run Rd. Bel Air, Maryland
	Southern Maryland	Prince George's Community College 301 Largo Rd. Largo, Maryland

Professional Judgment Approach

- Professional judgment approach overview
  - Convenes multiple panels of successful educators to identify the resources needed in schools and districts to achieve Maryland's state standards and other performance expectations
  - Panelists identify the components/resources needed for Maryland schools and districts to be successful
  - These components are then costed-out and an overall adequacy estimate produced

Professional Judgment Approach

- Consists of the following components of work:
  - Develop background materials (literature review, summary of state standards, panel meeting materials) for briefing panelists
  - Develop a set of representative districts and schools based on actual sizes, demographics, and grade configurations found in Maryland
  - Select panelists and convene panels
  - Create an Excel model for estimating the cost of implementing the PJ adequacy model in Maryland

Professional Judgment Approach

- Five progressive levels of panels of educators were convened between October 2015 and January 2016 at MSDE building in Baltimore:
  - 4 school level panels
  - 2 special needs panels
  - 1 district central office panel
  - 1 district chief financial officer panel
  - 1 statewide panel
- 77 accomplished educators were selected to participate on the nine panels
  - Panels included district & school administrators, teachers, teacher leaders, and school board members

Successful Schools Approach

- Successful schools approach overview:
  - Identifies successful schools using performance criteria based on state assessment data
    - Spending on administration, operations, and non-special needs instruction by these schools estimates adequate base amount
  - Used MSA/HSA data for initial analysis, reviewed results when 2015 & 2016 PARCC data became available
  - Because state has few districts, analysis was conducted at school level – collected school spending data from districts

Successful Schools Approach

- Consists of following work components:
  - Identify high performing schools
  - Collect and analyze school-level expenditure data
  - Determine a per pupil base cost

Successful Schools Approach

- 111 schools identified initially
- One school withdrawn due to high percentage of low-income students – unable to disentangle base spending from compensatory spending
- 39 schools ultimately dropped due to lower than average performance on PARCC
- 71 schools used for base cost estimate

Adequacy Study

- Also required to make recommendations on:
  - Whether changes to the FTE enrollment count should be made to address increasing/declining enrollments in school districts
  - The cost of providing universal, high-quality prekindergarten
  - How low-income students are counted for state aid purposes due to the federal Community Eligibility Provision
  - How local wealth is measured for state aid purposes, including whether to change the date(s) of the NTI data used in the measure
  - Whether to update the current Maryland Geographic Cost of Education Index or adopt a new methodology
  - Whether the Supplemental Grant program should be changed or discontinued

Overview of Current Maryland Education Finance System

School Finance: Foundation

- Foundation formula – State establishes the minimum per pupil funding amount for all students
  - $6,860 for FY 2015, $6,954 for FY 2016
- Applied to prior year's September 30 FTE student enrollment count
- Foundation amount based on adequacy recommendations from Thornton Commission study
- Foundation has not kept up with inflation

School Finance: Foundation

- Foundation is adjusted annually for inflation (except in certain years experiencing budget shortfalls)
  - Adjustment is lesser of the Consumer Price Index for the Baltimore-Washington region, the implicit price deflator for state and local governments, or 5%
- Foundation is also adjusted for regional cost differences using the Geographic Cost of Education Index (GCEI).
  - Only adjusts up for jurisdictions with higher than average regional costs of living

School Finance: Per Pupil Weights

- Additional weights are applied to the foundation to provide additional resources for students with special needs (per pupil amounts are for FY 2015)
  - Compensatory Education: 0.97 or $6,654. Applied to count of students eligible for federal free- and reduced-price meals program
  - Limited English Proficiency: 0.99 or $6,791. Applied to students eligible for program services
  - Special Education: 0.74 or $5,076. Applied to students eligible for program services

School Finance: State and Local Shares

- State Share:
  - Goal of providing 50 percent of total program revenues in state aid, on average, statewide
  - Minimum state aid guarantees of 15 percent of total program for foundation program, 40 percent of total program for special needs programs
  - The foundation and special needs formulas are all equalized, that is, jurisdictions with lower local wealth receive a larger proportion of total program in state aid than those with greater local wealth
  - State funding of major education programs was $5.8 billion in FY 2015

School Finance: State and Local Shares

- Local Share:
  - Jurisdictions (counties and the City of Baltimore) also appropriate local resources to fund local school districts
  - The foundation local share is the only major aid program requiring a local share determined by formula
  - Local appropriations for the special needs total program formulas are discretionary
  - Local appropriations totaled $5.7 billion in FY 2015

School Finance: State and Local Shares

- Determining State/Local Shares:
  - The foundation and special needs total program formulas are equalized based on local wealth
    - A jurisdiction's local wealth consists of: 50 percent of total applicable personal property + 40 percent of total real property + Net Taxable Income (NTI)
    - Either the September or November NTI is used, whichever results in the greatest state aid for a jurisdiction
  - Jurisdictions with lower local wealth receive a larger share of total program in state aid, districts with greater local wealth receive a smaller share in state aid – as low as the guaranteed minimum aid amount

School Finance: Other Aid Programs

- Guaranteed tax base (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 - may receive up to 20 percent of the per pupil foundation amount in additional state aid
- Net taxable income education grants: State uses Sept. or Nov. NTI - whichever produces the largest state aid amount in a district. If the Nov. NTI-based aid amount is larger, districts receive the difference in additional state aid

School Finance: Other Aid Programs

- 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 FY 2009 these 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. Nine districts currently receive this aid

School Finance: Other Aid Programs

- 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

Adequacy Study Results and Recommendations

Determining an Adequate Base Amount and Student Weights

Why We Used Multiple Approaches to Estimating Adequacy in Maryland

	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

Basis of Adequacy Estimate

- Study team felt that the most appropriate benchmark of success for determining adequacy is meeting Maryland's rigorous College and Career Ready Standards
- Evidence-based and professional judgment approaches best suited to estimating resources for meeting this benchmark

Results of Three Approaches

	2014-15 Maryland	Evidence-Based	Professional Judgment	Successful Schools
Base Cost	$6,860	$10,514	$11,607	$8,716
Weights				
Compensatory Education (At risk)	0.97	0.29	0.36	N/A
Limited English Proficient	0.99	0.37	0.61	N/A
Special Education	0.74	0.70	1.18	N/A
Prekindergarten		0.40	0.26	

* Note, Maryland weights are net of Federal dollars while adequacy weights are not. EB special education weight does not include severely disabled students while PJ weight does. PJ weights for at-risk and LEP are averages across varying concentrations.

Developing a Final Blended Base

- It was important to utilize all three approaches for the study team to understand the differences in base costs associated with meeting Maryland's benchmarks of success
- The final base cost figure is based on the results of both the PJ and EB approaches
  - The results of these two approaches best represent resources required to meet all state standards
  - The study team does not believe the SSD figure fully represents the current cost of adequacy in Maryland, however, the study team believes that the SSD figure could be used during the phasing-in of a new funding system
  - The final figure relies on the research and feedback from both the EB and PJ approaches and the case studies
  - The main areas of resource differences were identified and the differences were reconciled using all the information available from the two studies and the case studies

Shift to Higher Base Amount

- The estimates of the preferred EB and PJ approaches represent a significant shift from the current funding model – a shift from low base/larger weights to high base/smaller weights
- Clear message from the research and the Maryland educators serving on PJ panels was that all students, even those without special needs designations, require higher levels of support to meet today's greater performance expectations
- Current expectation is also for more supports, even for special needs-designated students, to occur in the regular education classroom
- Both the EB and PJ approaches, and thus the resulting blended base figure, represent this important shift toward allocating more resources through the base cost to provide a higher level of services to all students regardless of identified need

Services Included in Base Amount

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 embedded 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 all 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

Resource Prices

- Data on resource prices for staff compensation and technology were collected from the State and local school districts for estimating the base cost, including:
  - Average salaries for 73 different certified and classified staff working in central offices and schools
  - Employee benefits, including Social Security, Medicare, retirement, health insurance, Workers Compensation, and Unemployment Insurance

Resource Prices

- Retirement costs included in the base include the normal cost of teachers retirement for active members (the share of teachers' retirement districts are obligated to pay), but not the amortized accrued liability paid directly by the State
- Technology prices were collected from districts for computers and peripherals (admin. and instruction), and other instructional technology devices

Key Base Resource Differences: EB & PJ

- EB and PJ base estimates are similar, about $1,000 per student apart
- The main differences in base cost figures include:
  - Elementary class size ratios
  - Middle school teacher utilization rates
  - School administration
  - School level student support services
  - Career and Technical Education (CTE) included in PJ model but treated as a separate categorical aid in EB

Key Base Resource Differences: EB & PJ

	Evidence-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- No 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

Understanding Differences in Base

Elementary School Student-Teacher Ratios

- Elementary class size differs in grades 4 and 5, 25 to 1 in EB and 20 to 1 in PJ
  - PJ panels felt transition from 15 to 25 was too high, literature review also supported 20 to 1 as smallest grades 4/5 class size
  - deferred to the available best practice research and used the 25:1 ratio in grades 4 and 5 since additional teaching staff are added on top of the base once student need is considered

Understanding Differences in Base

Middle School Planning and Collaboration Time

- The EB model has a higher utilization rate requiring fewer teachers
  - The PJ model's lower utilization rate is partially offset by lowering the number of days needed for professional development
  - 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

Understanding Differences in Base

School Administrator Positions

- The PJ and EBPJ panels both mentioned the need for administrative time to ensure proper evaluation of teaching staff and to provide instructional leadership
- Panelists from both approaches had 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

Understanding Differences in Base

Student Support Services Positions

- Both the EBPJ and PJ panelists identified a significant need for student support resources, even at the base-level
- 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

Understanding Differences in Base

CTE Expenditures

- The PJ study included CTE expenditures in the base while the EB study kept CTE as a separate per student amount
- The study team determined that given CTE is not a separate component of the current funding system, these resources should be a part of the base

Developing Adjustments for Special Needs Students: Weights

- Once the blended base cost was determined, the study team:
  - Recalculated weights for special needs students using the blended base
  - Examined differences in the weights between the two models and made adjustments
  - Reviewed special needs weights nationally to ensure recommended weights were comparable

Compensatory Education

- The EB and PJ approaches to compensatory education have many similarities including additional instructional staff, additional support staff, and additional learning time
- EB weight of 0.29 and an averaged PJ weight across 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 alternative schools were included, the EB weight would be 0.31
- The PJ figure provides for necessary additional support services - a recommendation also made by the EB panels - therefore the study team recommends the higher rounded 0.40 weight for compensatory education

Compensatory Education and Concentrations of Poverty

- Study team also conducted a literature review to determine whether compensatory funding should increase for districts or schools with higher concentrations of poverty
- Goal of this study was to assess whether districts/schools with higher concentrations of poverty should receive more compensatory education aid per pupil (nonlinear funding) versus the same amount per pupil currently provided by formula (linear funding)
- The literature is quite clear that additional resources are needed to serve low-income students and mitigate the effects of poverty

Compensatory Education and Concentrations of Poverty

- The research is less clear on whether nonlinear funding mechanisms are warranted
- Many of the interventions suggested by the literature are currently funded and found in higher poverty schools and districts – incentives for highly effective teachers, extra instructional time, student support staff, attendance strategies, etc.
  - Current (2015) compensatory education formula provides an additional $1.7 million in a school of 500 students with 50 percent free- and reduced-price meal eligibility
- Study team recommends maintaining the linear approach. This recommendation provides sufficient funding for a range of services in schools with higher concentrations of poverty, including a school-based services coordinator

Limited English Proficiency (LEP)

- The LEP service model for the EB and PJ approaches varied significantly
  - The PJ approach is well resourced for both instruction and student support, while the EB approach assumes that support services would be addressed through the compensatory education weight; instructional caseloads were also higher for EB than PJ
  - The EB model identified a weight of 0.37, while the PJ identified an average weight across the concentration levels of 0.61
- 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 a combined weight of 0.80

Special Education

- Difference in the weights for special education between the two models was primarily caused by the exclusion of higher cost students from the weight in the EB model (funded separately by state)
  - PJ was 1.25 and EB was 0.70
    - Estimating the inclusion of higher cost special education students brought the EB weight up to 0.96
  - Averaging the EB and PJ weight produces a weight of 1.11
  - The study team recommends a rounded weight of 1.10 for special education students, including mild, moderate, and severe categories

Prekindergarten

- Models for preschool in the EB and PJ approach were similar
  - Both models include a 15:2 classroom ratio (one teacher and one instructional aide per 15 students)
  - Very low student-staff ratio drives the need for additional funding generated via a per pupil weight in both approaches
- Using the blended base cost, the weight for preschool for EB was 0.36 and the weight for PJ was 0.33
- The study team recommends a weight of 0.35 for prekindergarten students

Adjusting for Federal Funds

- The base figure and weights represent the total costs of providing educational services, so certain federal funds also used to fund these services must be deducted from the totals (also done for the Thornton study)
- Total of $485.6 million in federal funds from regular ed., compensatory ed., LEP, special ed., and early childhood programs

Recommendation for Blended Per Pupil Base and Weights

	Before Adjustment for Federal Funds	After Adjustment for Federal Funds
Base Amount	$10,970	$10,880
Compensatory Education	0.40	0.35
LEP	.040	0.35
Special Education	1.10	0.91
Prekindergarten	0.35	0.29

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

*Current Recommended Base Cost is prior to federal funds adjustment.

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

*Current Recommended amount does not include the increased prekindergarten enrollment or adjustments for regional cost differences such as the GCEI or the CWI.

Other Study Recommendations

Student FTE Enrollment Count

- Addresses declining enrollment by changing the FTE enrollment count used for calculating total program
  - FTE enrollment count would be the greater of the prior year's September 30th count or the rolling average of the three prior years
  - Provides declining enrollment districts time to adjust costs, protects districts with increasing enrollment
  - Recommended in the increasing and declining enrollment study final report

Counting Low-Income Students

- Continue counting low-income students using eligibility for the federal free- and reduced-price meals program
  - State would develop an alternative eligibility form to replace current federal form
  - Addresses issue of potential undercounts due to Community Eligibility Program rules
  - Provides greater stability for counts in comparison to using other proxies for low-income
  - Preferred recommendation from the evaluation of FRPM counts final report

Counting Low-Income Students

- Report also suggested an alternative option: Adopt a direct certification method of counting economically disadvantaged students in both non-CEP and CEP schools
  - Uses existing administrative data from support programs such as TANF, food stamps, and Medicaid
  - Targets more aid to higher-poverty districts, but results in much lower statewide count
  - Multiplier factors can be used to adjust statewide count, but still causes significant shifts in counts across districts

Expanding High-Quality Prekindergarten

- Adopt universal full-day prekindergarten for 4-year-olds
  - Four-year-olds would be included in September FTE enrollment count
  - Programs must be high-quality (meet Maryland EXELS level 5 or state or nationally accredited) to be eligible for funding
  - Students would receive a 0.29 weight
  - Recommended in the evaluation of state prekindergarten programs and funding final report

Expanding High-Quality Prekindergarten

- Recommendation would provide funding for 80 percent of Maryland's four-year-olds to attend either a public prekindergarten program or a private program that has received a rating of Level 5 in Maryland EXCELS or has national or state accreditation
- Other recommendations:
  - Continue to invest in early childhood data systems
  - Provide increased investment to support quality improvement efforts in child care centers and family homes to help them reach the highest EXCELS Level of 5
  - Encourage providers to participate in EXCELS and encourage parents to enroll their children in high-quality programs
  - Provide supports for private providers to improve their EXCELS quality level

Regional Cost Adjustment

- Replace the current GCEI with a three-year rolling average of the Comparable Wage Index (CWI)
  - Would be used with all total program formulas (foundation and special needs)
  - Would be applied to total program amounts – prior to determination of State and local shares
  - Would adjust for costs both above and below state average (not truncated for values less than 1.0)
  - Would more readily account for changes in regional cost differences since easily updated annually
  - Recommended in the evaluation of the Maryland GCEI reports

Equity and Local Wealth Measures

- Change the way in which local wealth is calculated
  - Net taxable income (NTI) would be determined using only the November NTI values
  - The multiplicative approach would be used for combining NTI and assessable property values
  - Improves equity, puts more weight on ability to pay local taxes, simplifies state aid calculations
  - Phase-in both of the NTI-related items to ease the transition for impacted counties
  - Recommended in the equity and local wealth measures study final report

Other Recommendations for Improving Equity

- Change the way State and local shares are determined
  - Eliminate the minimum aid guarantees of 15 percent of the foundation and 40 percent of special needs total program
  - Require local jurisdictions to contribute a full local share of special needs total program – calculated using same method as foundation program
  - Ensures that an adequate total program amount is provided for all students, improves equity
  - Recommended in adequacy study draft final report

Supplemental Grant Program

- The Supplemental Grant Program should be discontinued in its current form
  - Implementing new, adequate levels of funding eliminates the rationale for the Supplemental Grant Program
  - A new hold-harmless program may be necessary during the phase-in period for implementing these recommendations, but any hold-harmless provision should not become a permanent source of funding

Total Cost of All Recommendations

- Total funding for major Prek-12 education aid programs, excluding transportation and GTB, would increase by 29 percent, from $10.3 billion to $13.2 billion
- State share would increase 39 percent, from $4.9 billion to $6.8 billion
- Local appropriations would increase 19 percent, from $5.4 billion to $6.4 billion

Comparison of Current and Proposed Total Program: Foundation & Special Needs

Total Program Per Student				
Local Unit	Proposed	Current	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%

Comparison of Current and Proposed Total Program: Foundation & Special Needs

Total Program Per Student				
Local Unit	Proposed	Current	Change	Percent Change
Harford	$14,477	$9,595	$4,882	51%
Howard	$14,397	$8,958	$5,439	61%
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%**

Comparison of Proposed State & Local Shares and Current State Aids & Total Local Appropriations

	Total State Share				Total Local Share			
Local Unit	Proposed	Current	Change	Percent Change	Proposed Total Required Local Share	Current Total Local Appropriation	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%

Comparison of Proposed State & Local Shares and Current State Aids & Total Local Appropriations

	Total State Share				Total Local Share			
Local Unit	Proposed	Current	Change	Percent Change	Proposed Total Required Local Share	Current Total Local Appropriation	Change	Percent Change
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%)
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%**

Comparison of Proposed State & Local Shares and Current State Aids & Total Local Appropriations

Amounts Per Student				
Local Unit	Proposed	Current	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%

Comparison of Proposed State & Local Shares and Current State Aids & Total Local Appropriations

Amounts Per Student				
Local Unit	Proposed	Current	Change	Percent Change
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%**

Other Recommendations not Included in Cost Estimates

Supporting Districts with Changing Enrollment

- Study of Increasing and Declining Enrollment also recommended:
  - Developing better information for district level planning on:
    - Birth rates
    - Transportation cost detail
  - Implementing geographic information systems to support planning, provide data on school proximity for school closing or transportation decisions
  - Carry out a technology inventory – last update was 2010, may reveal technology opportunities to improve instruction and operational effectiveness
  - Increase MSDE capacity for providing technical assistance on difficult decisions such as:
    - School closings
    - Transportation efficiency balanced with safety and service levels
    - Shared staffing, consultants, or expertise

School Size

- Study team suggests creating a policy establishing maximum school sizes by school-level (elementary, middle, and high). These maximum school sizes would be set at the enrollment levels at which school operating costs were no longer benefiting from economies of scale and where student performance tends to decrease due to larger school size.
  - The research team suggests enrollment limits based on the points at which schools in Maryland start becoming both less cost efficient and less productive
  - These enrollment limits are set at 700 students for elementary schools, 900 students for middle schools, and 1,700 students for high schools
  - The study team does not recommend that schools in Maryland should be this large, but no newly constructed schools would be allowed to exceed these limits

School Size

- Recommend instituting a competitive grant program to support the construction of small schools and/or the renovation of existing large school buildings. Grants would help accommodate school-within-school models – that is, the program would be targeted toward replacing or reconfiguring the lowest-performing large schools in the State.
  - This recommendation would provide financial incentives and support for replacing the State's largest, low-performing schools or for renovating existing large school buildings to house them
  - Based on the study team's assumptions, up to 74 schools would be eligible for this type of grant. The estimated costs vary, but will ultimately be controlled by the fiscal decisions of State policy makers

Finance Components not Addressed by Study

Student Transportation

- Study team made no specific recommendation. But, increasing and declining enrollment report recommended the following:
  - Replace current formula with multivariate statistical model that establishes realistic cost and funding levels based on multiple factors that affect transportation costs
  - The formula should be designed to promote efficiency based on best practices from school systems and other transportation sectors
  - Adopting this recommendation would require:
    - Collecting more detailed transportation data from districts
    - Making State policy decisions on State/district share and wealth adjustment
  - Fund pilot projects for regional shared services and other innovations

Guaranteed Tax Base

- Study team suggests further study to determine if the GTB is still necessary or should be retained in another form
  - Requiring local shares for special needs total program may reduce need for comprehensive GTB
  - To preserve equity, State may want to consider an equalization formula to support lower wealth districts with appropriating operating funds above required total program amounts

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 percent
- The study team did not make a recommendation for changing or eliminating the current inflation adjustment

Tax Increment Financing

- Study team suggests further study of the issue of whether a portion of TIF increment values should be excluded from the local wealth measure
- Concern about state/local shares was raised in highly impacted jurisdictions such as Baltimore City
- Wealth and equity report suggested adopting an approach similar to Ohio's: excluding some portion of TIF increment value from local wealth base for education finance formula purposes
- Study team did not make a specific recommendation because it could find no research or best practice justification for the portion of value to be excluded

Considerations for Phase-In

- The study team recognizes these recommendations represent a structural shift in Maryland's finance system
- The team also believes this is the right approach for the State to take to meet its educational goals
- Therefore, the study team suggests phasing-in these recommendations

Considerations for Phase-In

- Phase-in should be guided by these two considerations:
  - New State funding should go toward funding students with special needs first
  - No district should receive less funding than it currently receives during phase-in

Questions?

Adequacy of Education Funding in Maryland

Presentation to the Commission on Innovation and Excellence in Education

Department of Legislative Services
Office of Policy Analysis
Annapolis, Maryland

December 8, 2016

Presentation Overview

- Adequacy Targets
- Adequacy in Fiscal 2002, 2008, and 2015
- Progress toward Adequate Funding
- Federal, State, and Local Funding
- Slowing Progress; Federal, State, and Local
- Comparing Actual Funding to Targets and Proposal

Adequacy Targets

- Adequacy: Funding should be sufficient to acquire the total resources needed to reasonably expect that **all** students can meet academic performance standards

- The Department of Legislative Services' calculation of adequacy targets:
  - Base per pupil cost of $5,969 in fiscal 2002 inflated by implicit price deflator (IPD) for State and local government expenditures.
  - Foundation program adjusted by regional cost index (GCEI)
  - Additional costs for at-risk students

    - Special education student: 1.17 x base per pupil cost
    - Economically disadvantaged student: 1.10 x base per pupil cost
    - Limited English proficient student: 1.00 x base per pupil cost

Fiscal 2002 Adequacy Analysis

	($ in Millions)			Per Pupil			Percent of
	Adequacy	Adjusted	Adequacy	Adequacy	Adjusted	Adequacy	Adequacy
County	Target	Revenue*	Gap	Target	Revenue*	Gap	Funded**
Allegany	$100.6	$78.3	$22.3	$10,171	$7,913	$2,258	77.8%
Anne Arundel	607.2	563.6	43.6	8,198	7,610	589	92.8%
Baltimore City	1,141.4	871.0	270.4	12,087	9,224	2,864	76.3%
Baltimore	924.0	858.8	65.2	8,879	8,252	627	92.9%
Calvert	128.5	117.7	10.8	7,876	7,214	662	91.6%
Caroline	53.3	36.3	17.0	9,885	6,737	3,149	68.1%
Carroll	210.9	191.0	19.9	7,554	6,839	715	90.5%
Cecil	133.7	109.6	24.1	8,562	7,017	1,545	82.0%
Charles	194.9	164.8	30.1	8,387	7,092	1,295	84.6%
Dorchester	47.0	36.1	10.9	10,138	7,792	2,346	76.9%
Frederick	294.6	262.0	32.6	7,891	7,017	874	88.9%
Garrett	45.5	36.3	9.2	9,601	7,659	1,942	79.8%
Harford	316.2	264.8	51.4	8,095	6,779	1,316	83.7%
Howard	348.7	376.3	0.0	7,639	8,243	0	107.9%
Kent	25.0	24.1	0.9	9,697	9,361	336	96.5%
Montgomery	1,203.4	1,288.7	0.0	8,953	9,587	0	107.1%
Prince George's	1,352.1	968.3	383.8	10,236	7,330	2,906	71.6%
Queen Anne's	57.2	52.3	4.9	8,163	7,468	696	91.5%
St. Mary's	126.4	107.8	18.6	8,528	7,270	1,258	85.3%
Somerset	30.1	24.8	5.3	10,365	8,524	1,842	82.2%
Talbot	38.3	32.7	5.6	8,784	7,510	1,274	85.5%
Washington	173.7	143.2	30.5	8,880	7,323	1,557	82.5%
Wicomico	128.9	101.2	27.7	9,198	7,224	1,974	78.5%
Worcester	59.6	57.1	2.5	8,949	8,569	380	95.7%
State Total	**$7,741.2**	**$6,766.7**	**$1,087.4**	**$9,207**	**$8,048**	**$1,293**	**86.0%**

*Selected Financial Data, Fiscal 2002, Maryland State Department of Education. Figures exclude unallocated revenues and revenues spent on student transportation and other revenues not linked to adequacy.

**State total percentage excludes funding that exceeds adequacy targets.

Fiscal 2002 Adequacy Summary

- There was a statewide adequacy gap of nearly $1.1 billion
- Statewide, adequacy was funded at 86.0%
- Four counties achieved 95.0% or above funding of their adequacy targets; including Howard and Montgomery which exceeded their targets
- Another five counties were funded at more than 90.0% of their adequacy targets
- Seven counties were funded at less than 80.0% of adequacy

Fiscal 2008 Adequacy Analysis

	($ in Millions)			Per Pupil			Percent of
	Adequacy	Adjusted	Adequacy	Adequacy	Adjusted	Adequacy	Adequacy
County	Target	Revenue*	Gap	Target	Revenue*	Gap	Funded**
Allegany	$110.7	$118.4	$0.0	$12,307	$13,165	$0	107.0%
Anne Arundel	745.6	823.4	0.0	10,385	11,469	0	110.4%
Baltimore City	1,172.0	1,177.7	0.0	15,095	15,168	0	100.5%
Baltimore	1,157.3	1,193.4	0.0	11,509	11,867	0	103.1%
Calvert	165.8	184.5	0.0	9,736	10,836	0	111.3%
Caroline	64.1	57.5	6.6	11,975	10,742	1,232	89.7%
Carroll	264.7	299.1	0.0	9,451	10,680	0	113.0%
Cecil	168.3	169.5	0.0	10,673	10,747	0	100.7%
Charles	261.3	286.1	0.0	10,097	11,055	0	109.5%
Dorchester	54.4	51.7	2.7	12,258	11,642	616	95.0%
Frederick	401.4	438.3	0.0	10,141	11,072	0	109.2%
Garrett	50.8	49.7	1.1	11,545	11,307	239	97.9%
Harford	390.3	417.3	0.0	10,191	10,896	0	106.9%
Howard	461.4	633.1	0.0	9,497	13,031	0	137.2%
Kent	26.2	27.7	0.0	12,158	12,870	0	105.9%
Montgomery	1,550.1	1,922.4	0.0	11,510	14,275	0	124.0%
Prince George's	1,605.7	1,526.1	79.6	13,043	12,396	646	95.0%
Queen Anne's	74.0	75.6	0.0	9,892	10,099	0	102.1%
St. Mary's	172.6	171.2	1.4	10,704	10,619	84	99.2%
Somerset	35.2	36.4	0.0	12,875	13,297	0	103.3%
Talbot	44.9	44.3	0.6	10,607	10,473	134	98.7%
Washington	242.0	233.6	8.4	11,418	11,023	394	96.5%
Wicomico	171.8	165.1	6.7	11,929	11,466	463	96.1%
Worcester	69.7	89.8	0.0	10,920	14,068	0	128.8%
State Total	**$9,460.3**	**$10,192.0**	**$106.9**	**$11,554**	**$12,447**	**$131**	**98.9%**

*Selected Financial Data, Fiscal 2008, Maryland State Department of Education. Figures exclude unallocated revenues and revenues spent on student transportation and other revenues not linked to adequacy.

** State total percentage excludes funding that exceeds adequacy targets.

Fiscal 2008 Adequacy Summary

- There was a statewide adequacy gap of $106.9 million.
- Statewide, adequacy was funded at 98.9%.
- All but one county (Caroline) achieved 95.0% or more of their adequacy targets; including 16 that exceeded their targets.

Fiscal 2015 Adequacy Analysis

	($ in Millions)			Per Pupil			Percent of
	Adequacy	Adjusted	Adequacy	Adequacy	Adjusted	Adequacy	Adequacy
County	Target	Revenue*	Gap	Target	Revenue*	Gap	Funded**
Allegany	$131.5	$117.6	$13.9	$15,735	$14,066	$1,669	89.4%
Anne Arundel	1,075.3	983.1	92.2	13,882	12,692	1,190	91.4%
Baltimore City	1,587.1	1,297.0	290.1	19,755	16,144	3,611	81.7%
Baltimore	1,634.3	1,400.9	233.4	15,396	13,197	2,199	85.7%
Calvert	194.9	205.7	0.0	12,466	13,155	0	105.5%
Caroline	85.4	66.2	19.2	16,135	12,514	3,621	77.6%
Carroll	313.8	315.6	0.0	12,298	12,368	0	100.6%
Cecil	218.7	188.9	29.8	14,641	12,648	1,993	86.4%
Charles	348.8	332.0	16.8	13,721	13,062	660	95.2%
Dorchester	75.6	61.4	14.2	16,496	13,401	3,094	81.2%
Frederick	525.9	490.1	35.8	13,253	12,350	902	93.2%
Garrett	53.1	50.0	3.1	14,313	13,468	845	94.1%
Harford	493.8	438.7	55.1	13,431	11,932	1,499	88.8%
Howard	651.1	790.8	0.0	12,390	15,047	0	121.4%
Kent	30.5	28.9	1.6	15,482	14,680	802	94.8%
Montgomery	2,274.3	2,199.1	75.2	15,129	14,629	500	96.7%
Prince George's	2,230.9	1,678.8	552.1	18,301	13,772	4,529	75.3%
Queen Anne's	97.9	88.4	9.5	13,088	11,820	1,269	90.3%
St. Mary's	226.5	201.7	24.8	13,349	11,887	1,462	89.0%
Somerset	47.7	41.1	6.6	17,453	15,047	2,407	86.2%
Talbot	64.0	52.0	12.0	14,639	11,884	2,755	81.2%
Washington	323.0	279.2	43.8	14,834	12,822	2,012	86.4%
Wicomico	230.9	184.1	46.8	15,868	12,654	3,214	79.7%
Worcester	90.9	104.7	0.0	14,488	16,693	0	115.2%
State Total	**$13,005.9**	**$11,595.9**	**$1,576.0**	**$15,396**	**$13,727**	**$1,866**	**87.9%**

*Selected Financial Data, Fiscal 2015, Maryland State Department of Education. Figures exclude unallocated revenues and revenues spent on student transportation and other revenues not linked to adequacy.

**State total percentage excludes funding that exceeds adequacy targets.

Fiscal 2015 Adequacy Summary

- There was a statewide adequacy gap of $1.6 billion.
- Statewide, adequacy was funded at 87.9%.
- Six counties achieved 95.0% or above funding of their adequacy targets; including four that exceeded their targets.
- Another five counties were funded at more than 90.0% of their adequacy targets.
- Three counties were funded at less than 80.0% of adequacy.

Fiscal 2002 to 2008 Progress

	Adequacy Gap ($ in Millions)			Adequacy Gap Per Pupil			Percent of Adequacy Funded		
County	**FY 2002**	**FY 2008**	**Progress**	**FY 2002**	**FY 2008**	**Progress**	**FY 2002**	**FY 2008**	**Progress**
Allegany	$22.3	$0.0	$22.3	$2,258	$0	$2,258	77.8%	107.0%	29.2%
Anne Arundel	43.6	0.0	43.6	589	0	589	92.8%	110.4%	17.6%
Baltimore City	270.4	0.0	270.4	2,864	0	2,864	76.3%	100.5%	24.2%
Baltimore	65.2	0.0	65.2	627	0	627	92.9%	103.1%	10.2%
Calvert	10.8	0.0	10.8	662	0	662	91.6%	111.3%	19.7%
Caroline	17.0	6.6	10.4	3,149	1,232	1,916	68.1%	89.7%	21.6%
Carroll	19.9	0.0	19.9	715	0	715	90.5%	113.0%	22.5%
Cecil	24.1	0.0	24.1	1,545	0	1,545	82.0%	100.7%	18.7%
Charles	30.1	0.0	30.1	1,295	0	1,295	84.6%	109.5%	24.9%
Dorchester	10.9	2.7	8.1	2,346	616	1,731	76.9%	95.0%	18.1%
Frederick	32.6	0.0	32.6	874	0	874	88.9%	109.2%	20.3%
Garrett	9.2	1.1	8.2	1,942	239	1,704	79.8%	97.9%	18.2%
Harford	51.4	0.0	51.4	1,316	0	1,316	83.7%	106.9%	23.2%
Howard	0.0	0.0	N/A	0	0	N/A	107.9%	137.2%	29.3%
Kent	0.9	0.0	0.9	336	0	336	96.5%	105.9%	9.3%
Montgomery	0.0	0.0	N/A	0	0	N/A	107.1%	124.0%	16.9%
Prince George's	383.8	79.6	304.2	2,906	646	2,259	71.6%	95.0%	23.4%
Queen Anne's	4.9	0.0	4.9	696	0	696	91.5%	102.1%	10.6%
St. Mary's	18.6	1.4	17.3	1,258	84	1,173	85.3%	99.2%	14.0%
Somerset	5.3	0.0	5.3	1,842	0	1,842	82.2%	103.3%	21.0%
Talbot	5.6	0.6	5.0	1,274	134	1,140	85.5%	98.7%	13.2%
Washington	30.5	8.4	22.1	1,557	394	1,162	82.5%	96.5%	14.1%
Wicomico	27.7	6.7	21.0	1,974	463	1,511	78.5%	96.1%	17.6%
Worcester	2.5	0.0	2.5	380	0	380	95.7%	128.8%	33.1%
State Total	**$1,087.4**	**$106.9**	**$980.4**	**$1,293**	**$131**	**$1,163**	**86.0%**	**98.9%**	**12.9%**

Fiscal 2002 to 2008 Progress

- Statewide, the adequacy gap was narrowed by $980.4 million in fiscal 2008; nearly all of the gap since 2002.
- The adequacy gap was eliminated in 14 counties.
- In 14 other counties, the per pupil gap was reduced by more than $1,000.
- In another six counties, the per pupil gap was reduced by more than $500.
- The percentage of adequacy funded increased to almost 100%.

Fiscal 2002 to 2015 Progress

	Adequacy Gap ($ in Millions)			Adequacy Gap Per Pupil			Percent of Adequacy Funded		
County	**FY 2002**	**FY 2015**	**Progress**	**FY 2002**	**FY 2015**	**Progress**	**FY 2002**	**FY 2015**	**Progress**
Allegany	$22.3	$13.9	$8.4	$2,258	$1,669	$589	77.8%	89.4%	11.6%
Anne Arundel	43.6	92.2	-48.6	589	1,190	-602	92.8%	91.4%	-1.4%
Baltimore City	270.4	290.1	-19.7	2,864	3,611	-748	76.3%	81.7%	5.4%
Baltimore	65.2	233.4	-168.2	627	2,199	-1,572	92.9%	85.7%	-7.2%
Calvert	10.8	0.0	10.8	662	0	662	91.6%	105.5%	13.9%
Caroline	17.0	19.2	-2.2	3,149	3,621	-472	68.1%	77.6%	9.4%
Carroll	19.9	0.0	19.9	715	0	715	90.5%	100.6%	10.0%
Cecil	24.1	29.8	-5.6	1,545	1,993	-447	82.0%	86.4%	4.4%
Charles	30.1	16.8	13.3	1,295	660	636	84.6%	95.2%	10.6%
Dorchester	10.9	14.2	-3.3	2,346	3,094	-748	76.9%	81.2%	4.4%
Frederick	32.6	35.8	-3.2	874	902	-28	88.9%	93.2%	4.3%
Garrett	9.2	3.1	6.1	1,942	845	1,097	79.8%	94.1%	14.3%
Harford	51.4	55.1	-3.7	1,316	1,499	-183	83.7%	88.8%	5.1%
Howard	0.0	0.0	N/A	0	0	N/A	107.9%	121.4%	13.5%
Kent	0.9	1.6	-0.7	336	802	-466	96.5%	94.8%	-1.7%
Montgomery	0.0	75.2	-75.2	0	500	-500	107.1%	96.7%	-10.4%
Prince George's	383.8	552.1	-168.3	2,906	4,529	-1,623	71.6%	75.3%	3.6%
Queen Anne's	4.9	9.5	-4.6	696	1,269	-573	91.5%	90.3%	-1.2%
St. Mary's	18.6	24.8	-6.2	1,258	1,462	-205	85.3%	89.0%	3.8%
Somerset	5.3	6.6	-1.2	1,842	2,407	-565	82.2%	86.2%	4.0%
Talbot	5.6	12.0	-6.5	1,274	2,755	-1,481	85.5%	81.2%	-4.3%
Washington	30.5	43.8	-13.4	1,557	2,012	-455	82.5%	86.4%	4.0%
Wicomico	27.7	46.8	-19.1	1,974	3,214	-1,240	78.5%	79.7%	1.2%
Worcester	2.5	0.0	2.5	380	0	380	95.7%	115.2%	19.5%
State Total	**$1,087.4**	**$1,576.0**	**-$488.6**	**$1,293**	**$1,866**	**-$572**	**86.0%**	**87.9%**	**1.9%**

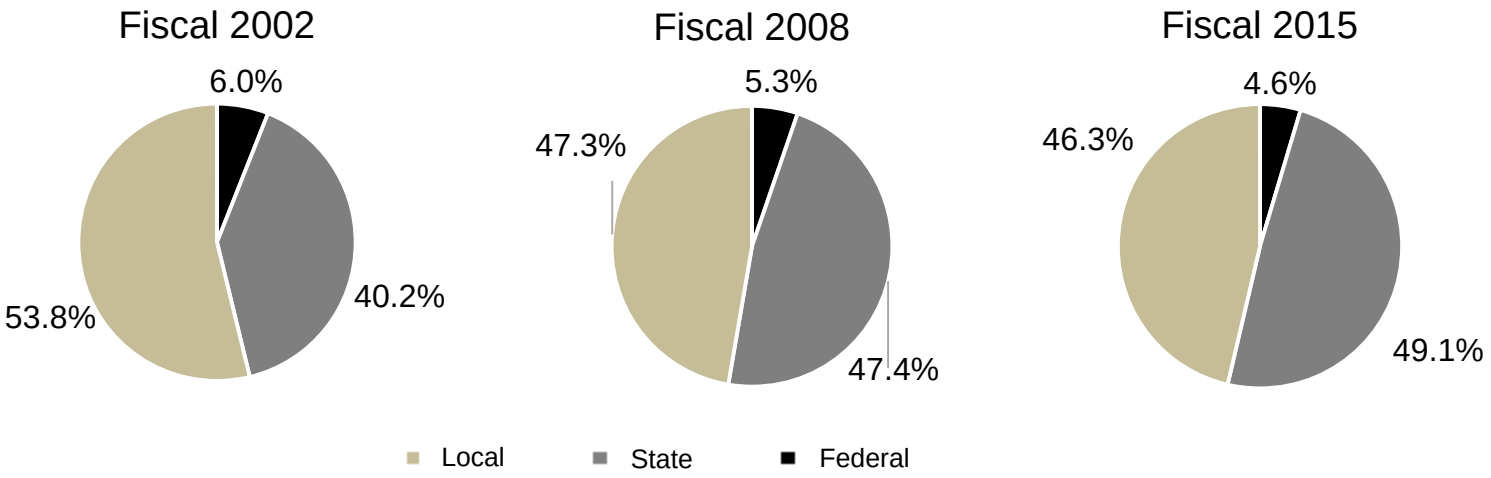
Fiscal 2002 to 2015 Progress

- Statewide, the adequacy gap increased by $488.6 million in fiscal 2015; nearly half since fiscal 2002.
- In four counties, the per pupil gap increased by more than $1,000.
- In another six counties, the per pupil gap increased by $500 or more.
- On a per pupil basis, six counties gained ground toward filling the gap.
- The percentage of adequacy funded increased by 1.9 percentage points.

School System Funding Trends by Source

Revenue Source	FY 2002 to 2008 Annual % Change	FY 2008 to 2015 Annual % Change	Fiscal 2002 to 2015 Annual % Change
Federal Aid*	4.9%	-0.1%	2.2%
State Aid**	10.2%	2.4%	5.9%
Local Appropriations	4.9%	1.6%	3.1%
Total	**7.2%**	**1.9%**	**4.3%**

* Not including food service.
** Not including unallocated State aid.



Source: Selected Financial Data

Using Different Annual Per Pupil Foundation Amounts

	($ per Pupil)		
Per Pupil Foundation Amount	**Fiscal 2002**	**Fiscal 2008**	**Fiscal 2015**
Actual*	$4,124	$6,694	$6,860
Full Adequacy Using IPD**	$5,443	$6,694	$8,171
$ Difference	$1,319	$0	$1,311
% Difference	32%	0%	19%
Full Adequacy Using Lesser of CPI-U and IPD***	$5,443	$6,694	$7,639
$ Difference	$1,319	$0	$779
% Difference	32%	0%	11%

*Actual reflects statutory changes made after the enactment of the Bridge to Excellence in Public Schools Act of 2002 that altered the per pupil foundation amounts in fiscal 2009 through 2015.

**Fiscal 2009 through 2015 are inflated annually by the actual implicit price deflator (IPD) for State and local government expenditures.

***Fiscal 2009 through 2015 are inflated by the lesser of IPD or the Consumer Price Index for All Urban Consumers for the Washington-Baltimore metropolitan area (CPI-U) capped at 5% annually.

State Education Aid Using Different Per Pupil Foundation Amounts

($ in Millions)

	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Actual State Aid*	$4,170.0	$4,276.5	$4,324.2	$4,439.4	$4,509.2	$4,621.2	$4,747.1	$4,869.6
IPD (actual)**	4,170.0	4,449.5	4,724.9	4,858.2	5,063.4	5,318.6	5,489.4	5,712.1
Difference vs. Actual	**$0.0**	**-$173.1**	**-$400.7**	**-$418.8**	**-$554.2**	**-$697.4**	**-$742.3**	**-$842.4**
Lesser of CPI-U and IPD***	4,170.0	4,363.5	4,571.0	4,700.6	4,811.1	5,058.2	5,217.2	5,349.6
Difference vs. Actual	**$0.0**	**-$87.0**	**-$246.8**	**-$261.2**	**-$301.9**	**-$437.1**	**-$470.1**	**-$479.9**

*Actual reflects statutory changes made after the enactment of the Bridge to Excellence in Public Schools Act of 2002 that altered the per pupil foundation amounts in fiscal 2009 through 2015.

**Fiscal 2009 through 2015 are inflated annually by the implicit price deflator (IPD) for State and local government expenditures.

***Fiscal 2009 through 2015 are inflated by the lesser of IPD or the Consumer Price Index for All Urban Consumers for the Washington-Baltimore metropolitan area (CPI-U) capped at 5% annually.

Fiscal 2015 State and Local Funding – Actual, Target, and Proposed

Note: For comparability, all funding excludes transportation, retirement, and other funding not associated with adequacy. Also excludes federal funds.

*Target weights for compensatory education, limited English proficiency, and special education aid formulas are adjusted for federal funds.

Source: Department of Legislative Services

Appendix

State Aid Trend

	($ in Millions)			Average Annual % Change	
County	**FY 2002**	**FY 2008**	**FY 2015**	**2002 to 2008**	**2008 to 2015**
Allegany	$47.9	$88.9	$85.2	10.8%	-0.6%
Anne Arundel	203.2	313.0	396.2	7.5%	3.4%
Baltimore City	584.3	889.8	982.9	7.3%	1.4%
Baltimore	308.3	572.1	684.6	10.9%	2.6%
Calvert	49.7	94.7	96.5	11.4%	0.3%
Caroline	24.5	45.2	53.2	10.7%	2.4%
Carroll	89.4	158.0	156.0	10.0%	-0.2%
Cecil	57.9	107.1	114.9	10.8%	1.0%
Charles	81.4	161.1	184.4	12.0%	1.9%
Dorchester	19.7	33.7	41.6	9.4%	3.0%
Frederick	113.6	222.0	266.9	11.8%	2.7%
Garrett	20.2	28.1	24.5	5.7%	-1.9%
Harford	128.3	231.8	235.1	10.4%	0.2%
Howard	117.6	222.5	281.3	11.2%	3.4%
Kent	9.1	11.7	11.9	4.2%	0.2%
Montgomery	278.5	511.6	787.0	10.7%	6.3%
Prince George's	514.0	995.8	1,104.8	11.7%	1.5%
Queen Anne's	20.9	34.0	39.7	8.5%	2.3%
St. Mary's	52.5	99.2	111.3	11.2%	1.7%
Somerset	13.9	25.6	31.9	10.6%	3.2%
Talbot	7.5	12.9	17.0	9.4%	4.1%
Washington	69.8	147.8	183.9	13.3%	3.2%
Wicomico	54.5	113.7	142.0	13.0%	3.2%
Worcester	11.1	22.4	26.3	12.4%	2.3%
State Total	**$2,877.8**	**$5,142.6**	**$6,059.0**	**10.2%**	**2.4%**

Note: Includes transportation and other State aid programs not linked to adequacy. Excludes unallocated State aid.

Local Funding Trend

	Local Appropriation ($ in Millions)			Average Annual % Change	
County	**FY 2002**	**FY 2008**	**FY 2015**	**2002 to 2008**	**2008 to 2015**
Allegany	$26.0	$28.4	$29.4	1.5%	0.5%
Anne Arundel	367.6	514.3	603.5	5.8%	2.3%
Baltimore City	210.3	200.4	254.7	-0.8%	3.5%
Baltimore	546.0	617.9	738.1	2.1%	2.6%
Calvert	68.9	95.4	115.8	5.6%	2.8%
Caroline	10.7	12.3	13.4	2.3%	1.3%
Carroll	107.2	151.1	171.0	5.9%	1.8%
Cecil	50.9	64.4	75.5	4.0%	2.3%
Charles	85.7	135.9	161.9	8.0%	2.5%
Dorchester	14.4	16.7	18.5	2.5%	1.5%
Frederick	149.6	228.4	233.5	7.3%	0.3%
Garrett	15.1	21.9	26.7	6.4%	2.9%
Harford	138.3	199.6	223.7	6.3%	1.6%
Howard	274.5	427.2	530.4	7.6%	3.1%
Kent	13.5	16.2	17.2	3.1%	0.8%
Montgomery	1,030.0	1,449.8	1,476.9	5.9%	0.3%
Prince George's	468.4	584.5	630.2	3.8%	1.1%
Queen Anne's	31.0	43.9	51.2	6.0%	2.2%
St. Mary's	52.5	76.0	93.9	6.4%	3.1%
Somerset	8.7	8.8	9.6	0.2%	1.3%
Talbot	24.1	31.7	35.3	4.7%	1.6%
Washington	69.6	85.6	94.8	3.5%	1.5%
Wicomico	43.7	49.4	40.4	2.1%	-2.8%
Worcester	44.5	66.7	77.7	7.0%	2.2%
State Total	**$3,851.1**	**$5,126.4**	**$5,723.5**	**4.9%**	**1.6%**

Source: Selected Financial Data

Federal Funding Trend

	($ in Millions)			Average Annual % Change	
County	**FY 2002**	**FY 2008**	**FY 2015**	**2002 to 2008**	**2008 to 2015**
Allegany	$9.0	$8.6	$10.4	-0.7%	2.7%
Anne Arundel	28.0	39.3	41.9	5.8%	0.9%
Baltimore City	125.0	138.2	119.8	1.7%	-2.0%
Baltimore	40.2	65.8	64.2	8.6%	-0.4%
Calvert	6.3	6.9	8.5	1.7%	2.9%
Caroline	3.8	4.4	4.6	2.4%	0.8%
Carroll	8.6	10.7	11.1	3.7%	0.5%
Cecil	7.2	7.9	10.0	1.7%	3.5%
Charles	8.0	11.8	12.1	6.6%	0.4%
Dorchester	4.2	5.2	5.5	3.7%	0.8%
Frederick	11.6	14.3	16.5	3.6%	2.0%
Garrett	4.2	4.1	3.9	-0.4%	-0.7%
Harford	14.9	16.9	19.2	2.2%	1.8%
Howard	9.5	17.2	19.5	10.4%	1.8%
Kent	2.9	2.3	2.2	-3.3%	-0.9%
Montgomery	43.8	77.3	74.0	9.9%	-0.6%
Prince George's	59.0	88.5	84.2	7.0%	-0.7%
Queen Anne's	3.9	4.1	4.7	1.2%	1.7%
St. Mary's	10.0	10.8	14.0	1.4%	3.7%
Somerset	3.9	5.1	3.8	4.5%	-4.3%
Talbot	3.0	2.7	3.4	-1.7%	3.6%
Washington	9.0	12.8	16.4	6.2%	3.5%
Wicomico	8.2	10.8	12.3	4.7%	1.9%
Worcester	5.1	6.6	7.7	4.5%	2.2%
State Total	**$429.1**	**$572.6**	**$569.9**	**4.9%**	**-0.1%**

Source: Selected Financial Data. Excludes food service funding.

Analysis of Local School System Expenditures

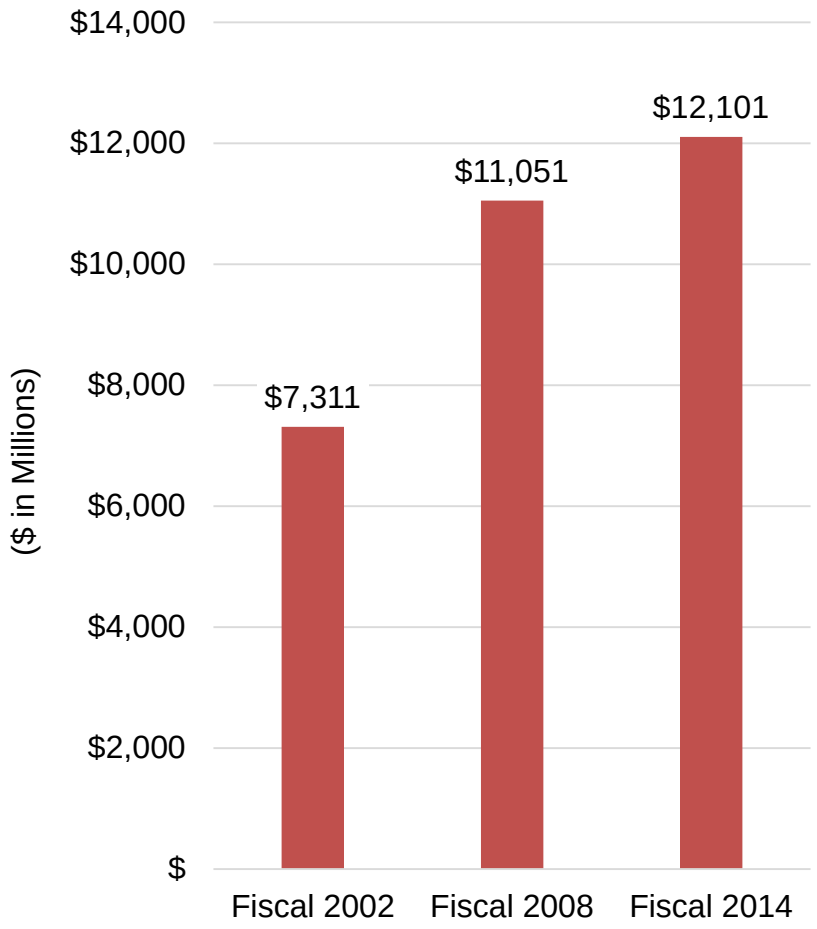
Presentation to the
Commission on Innovation and Excellence in Education

Department of Legislative Services
Office of Policy Analysis
Annapolis, Maryland

December 8, 2016

Some Context – Total Revenues for Current Expense Fund

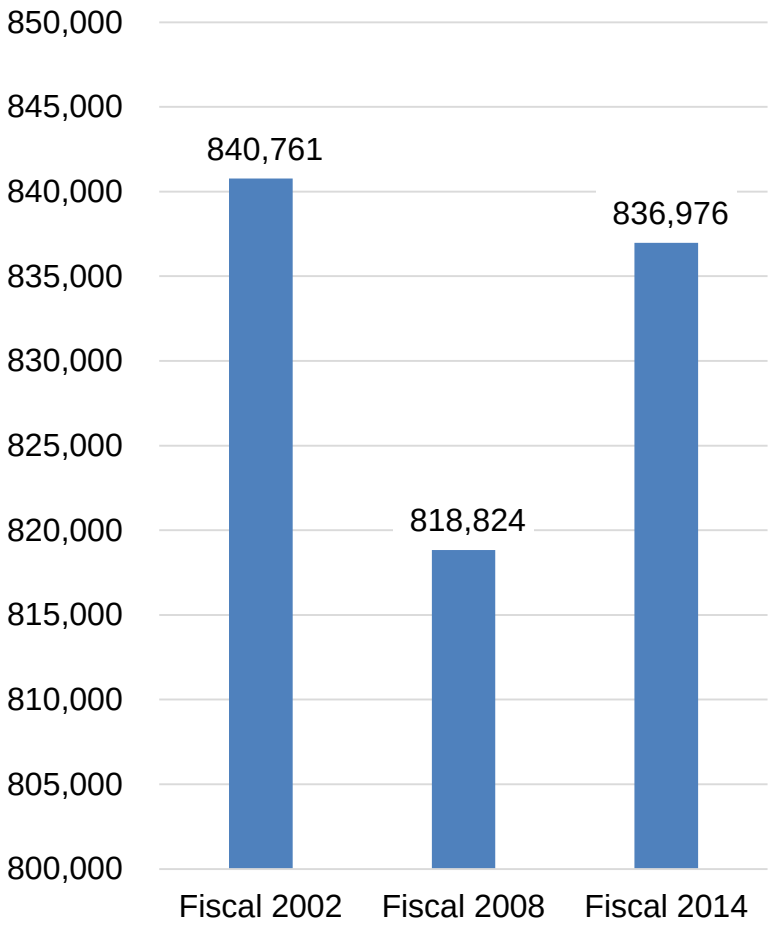
- Includes local, State, and federal appropriations
- Fiscal 2002-2008 – increase of 51%
- Fiscal 2008-2014 – increase of 10%
- Fiscal 2002-2014 – increase of 66%



Note: Excludes nonrevenue
Source: Selected Financial Data Part 1, Maryland State Department of Education

More Context – K-12 Enrollment Changes

- Enrollment declined by 2.6% from fiscal 2002 to 2008
- Between fiscal 2008 and 2014 enrollment increased 2.2%
- But not quite rebounding to 2002 level



Note: Excludes Pre-K
Source: Department of Legislative Services

Local School System Expenditures

- Expenditures are classified as those made from the Current Expense Fund
  - Board of Education administration
  - School-level administration
  - Instruction
  - Special education
  - Fixed charges – pension, health insurance, etc.
  - Student personnel services – truancy and attendance
  - Health services
  - Student transportation
  - Operation and maintenance of plant
  - Community services
  - Capital outlay

- And those made from other funds –
  - Food service, school construction, debt service, and student activities

Current Expense Fund Expenditures

	$ in Millions			% Change		
Budget Category	**FY 2002**	**FY 2008**	**FY 2014**	**FY 2002-2008**	**FY 2008-2014**	**FY 2002-2014**
Administration	$240	$369	$415	54%	12%	73%
Mid-level Administration	566	893	988	58%	11%	75%
Instruction	3,869	5,537	5,993	43%	8%	55%
Special Education	1,049	1,637	1,910	56%	17%	82%
Student Personnel Services	51	99	108	94%	9%	111%
Health Services	47	74	96	59%	29%	105%
Student Transportation	386	589	673	53%	14%	74%
Operation of Plant	504	821	898	63%	9%	78%
Maintenance of Plant	165	260	282	58%	8%	71%
State Paid Retirement	328	566	728	73%	29%	122%
Other	26	57	59	119%	4%	127%
Total Expenditures	**$7,230**	**$10,903**	**$12,149**	**51%**	**11%**	**68%**

Note: All categories include the locally paid fixed charges associated with those categories. Other includes community service and capital outlay. Does not include noncurrent expense fund expenditures. Until fiscal 2013, the State paid 100% of teachers' retirement costs. Locally paid costs are spread across the budget categories in fiscal 2014.
Source: Selected Financial Data Part 2, Maryland State Department of Education

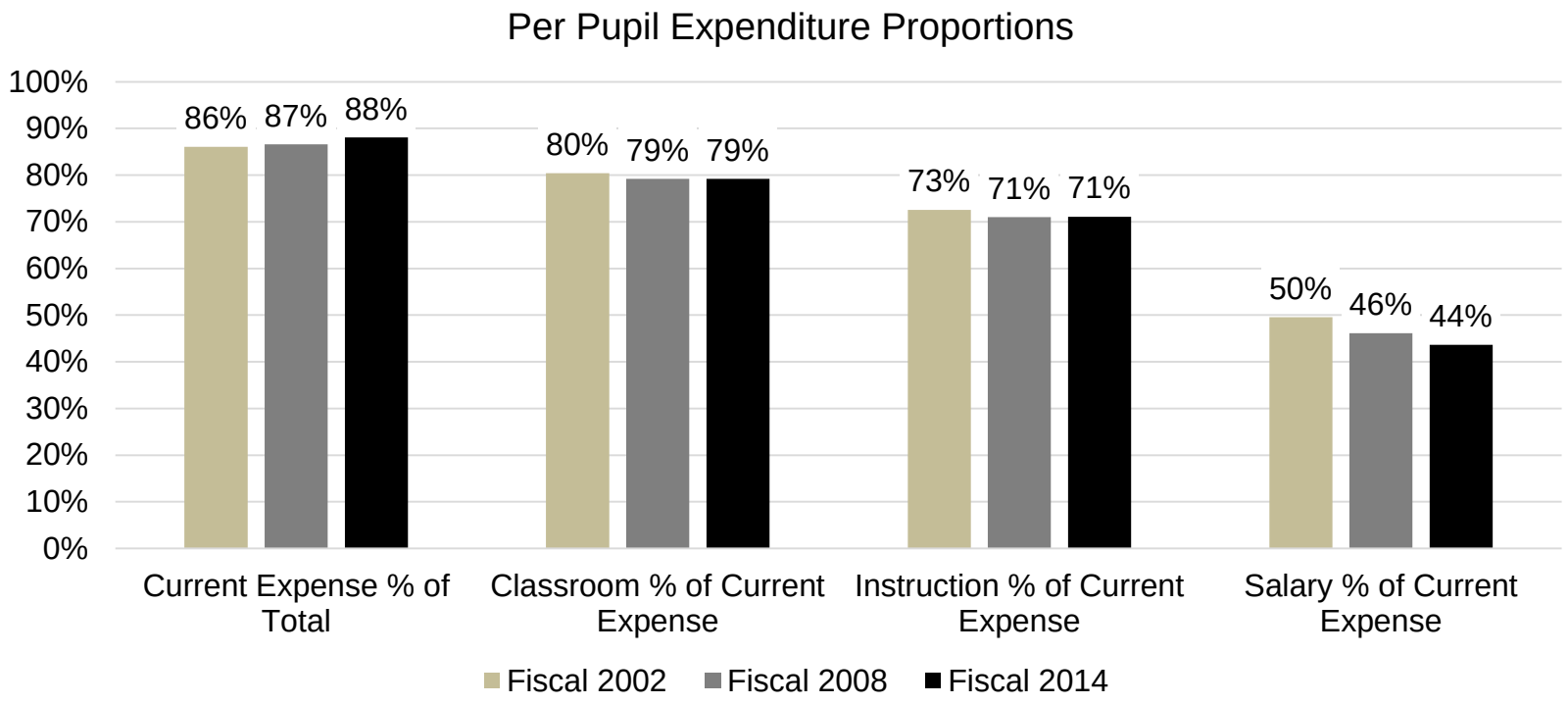
Total Expenditure Increases by $3.7 Billion, 51% from Fiscal 2002 to 2008

- Classroom – $2.822 billion, 49%
  - Of that amount – $2.495 billion was for instruction
    - Of that amount – $1.441 billion was for salaries

- Other increases
  - County board of education administration – $129 million, 54%
  - Operation and maintenance of plant – $413 million, 62%
  - Transportation – $203 million, 53%
  - Student personnel – $48 million, 94%
  - Other – $31 million, 119%

Note: Classroom includes mid-level administration, instruction, special education, fixed charges associated with those categories, and the State share of teachers' retirement. Instruction includes nonspecial education and special education, fixed charges for those two categories, and the State share of teachers' retirement. Salary includes the salaries and wages of nonspecial education and special education. Salary does not include retirement.
Source: Selected Financial Data Part 2, Maryland State Department of Education

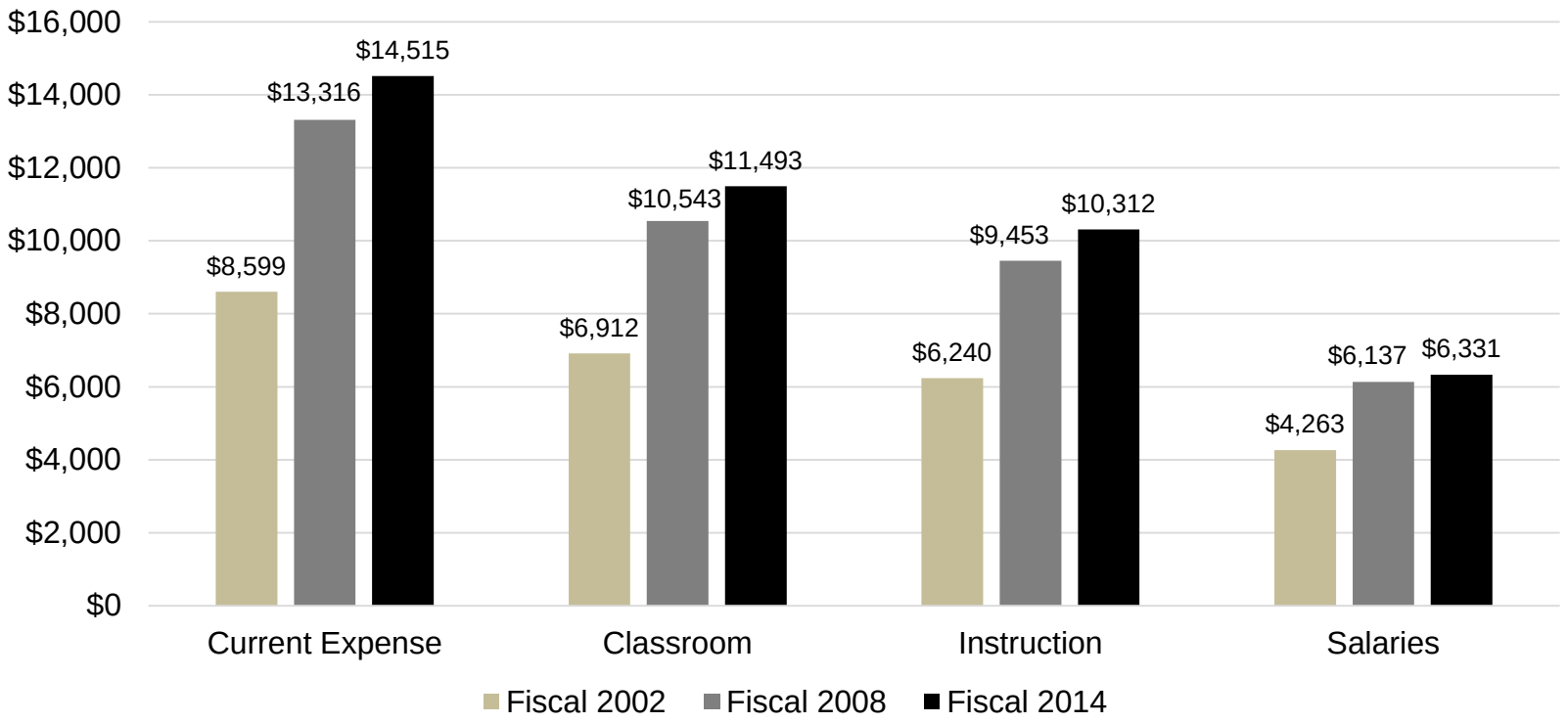
Basic Structure of Expenditures Largely Unchanged Since Bridge to Excellence



Note: Classroom includes mid-level administration, instruction, special education, fixed charges associated with those categories, and the State share of teachers' retirement. Instruction includes nonspecial education and special education, fixed charges for those two categories, and the State share of teachers' retirement. Salary includes the salaries and wages of nonspecial education and special education. Salary does not include retirement.

Source: Selected Financial Data Part 2, Maryland State Department of Education

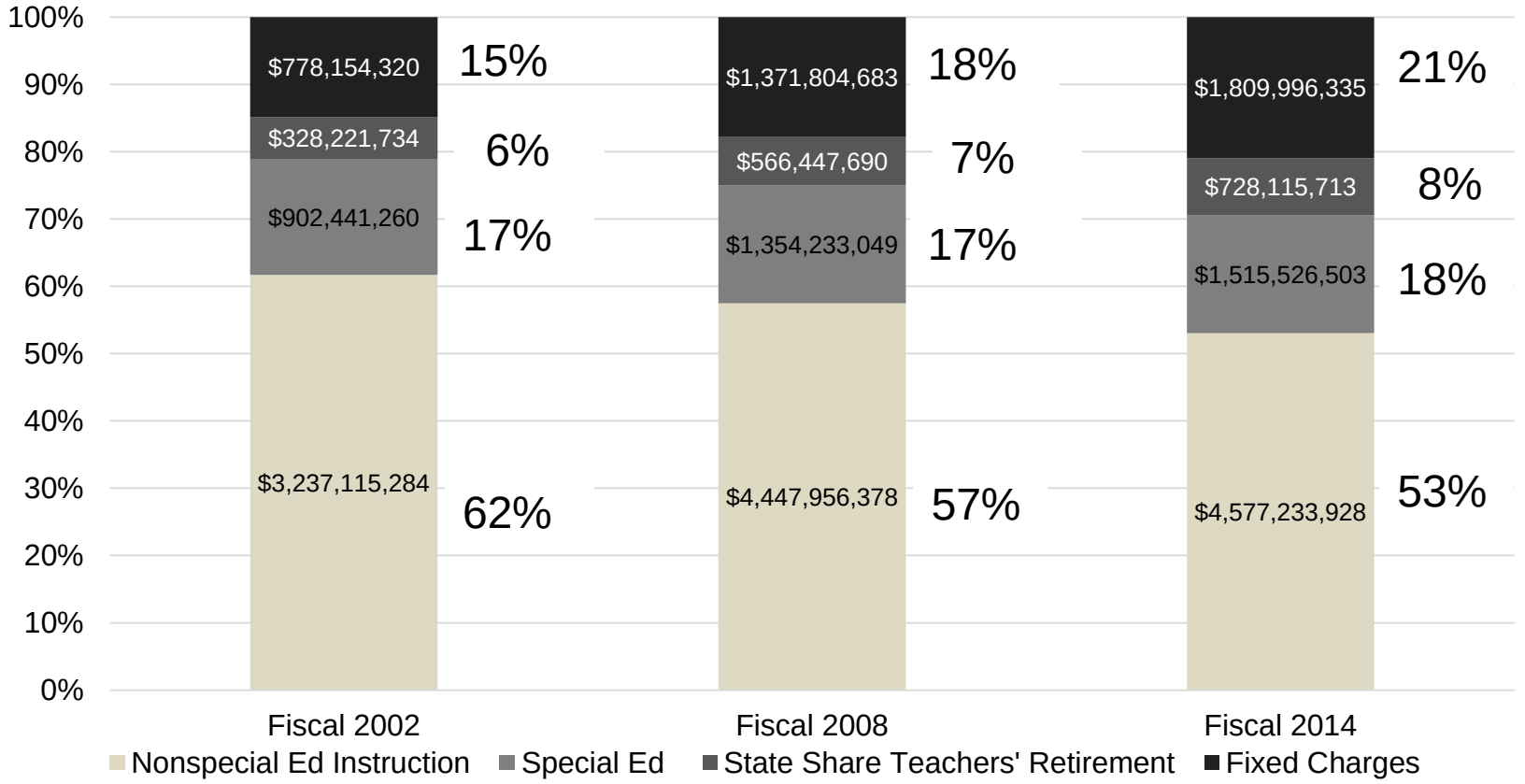
Per Pupil Expenditures Continue to Increase



Note: Classroom includes mid-level administration, instruction, special education, fixed charges associated with those categories, and the State share of teachers' retirement. Instruction includes nonspecial education and special education, fixed charges for those two categories, and the State share of teachers' retirement. Salary includes the salaries and wages of nonspecial education and special education. Salary does not include retirement.

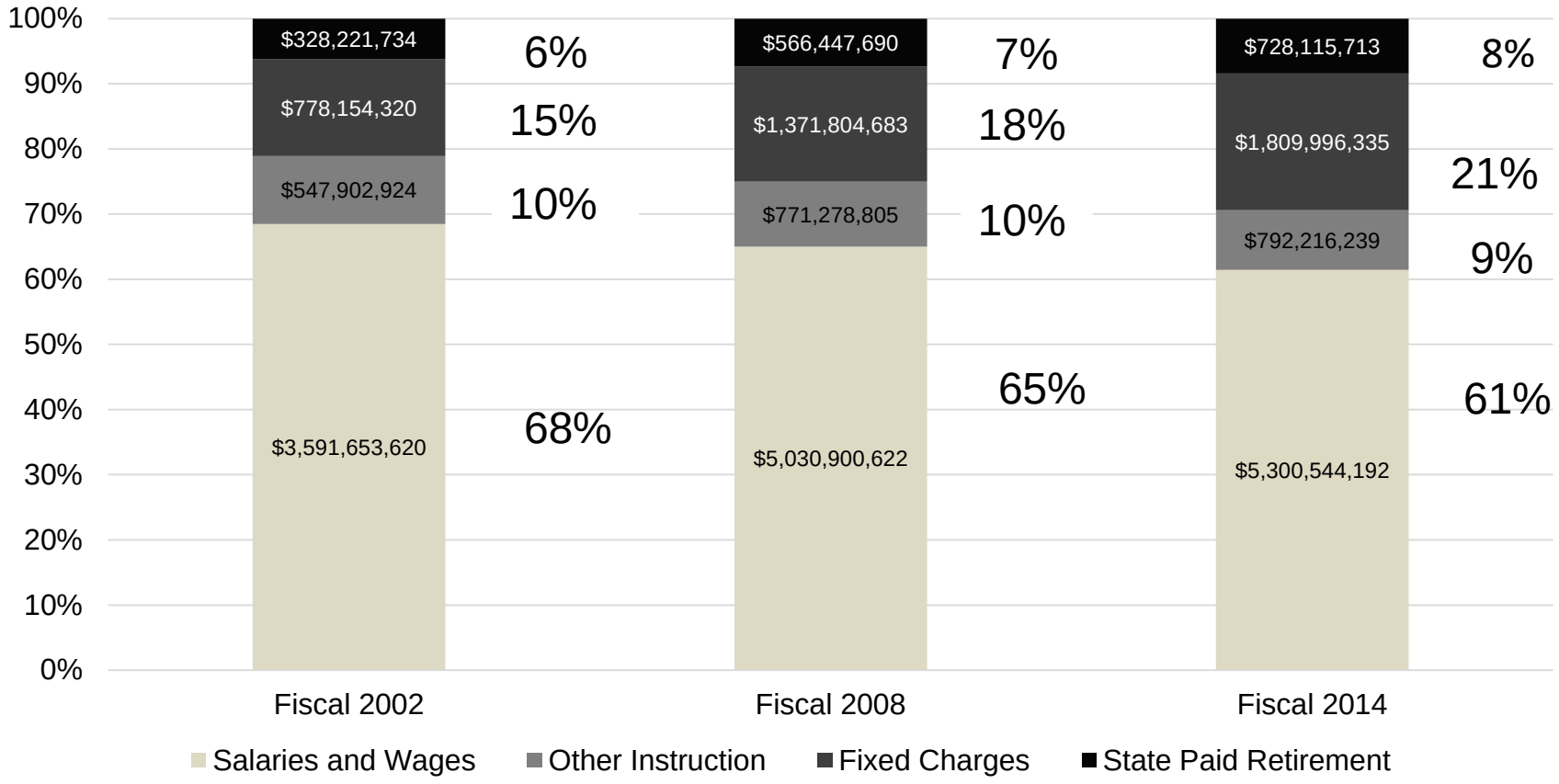
Source: Selected Financial Data Part 2, Maryland State Department of Education

Fixed Charges Grow Faster than Other Instruction Categories



Note: Fixed charges include locally paid teachers' retirement, other employees' retirement, social security, other employee benefits such as health insurance, purchased services, and other charges.
Source: Selected Financial Data Part 2, Maryland State Department of Education

A Different Look at Components of Instruction



Note: Fixed charges include locally paid teachers' retirement, other employees' retirement, social security, other employee benefits such as health insurance, purchased services, and other charges. Other instruction includes instructional equipment, supplies, textbooks, etc.
Source: Selected Financial Data Part 2, Maryland State Department of Education

Instructional Staff Increase by 13.3% Since 2002

	Number of Staff			Percent Change		
	FY 2002	FY 2008	FY 2014	FY 02-08	FY 08-14	FY 02-14
Total Staff	**103,534**	**118,124**	**116,489**	**14.1%**	**-1.4%**	**12.5%**
Total Instructional	70,719	80,540	80,117	13.9%	-0.5%	13.3%
Teachers[1]	53,793	59,132	58,431	9.9%	-1.2%	8.6%
Media, Guidance, and Psychologists	3,841	4,352	4,236	13.3%	-2.7%	10.3%
Other Professionals[2]	3,085	4,334	4,470	40.5%	3.1%	44.9%
Aides	10,000	12,722	12,981	27.2%	2.0%	29.8%
Total Noninstructional	32,815	37,583	36,372	14.5%	-3.2%	10.8%
Administrative	143	146	152	2.0%	4.3%	6.4%
Mid-level[3]	4,639	5,818	5,750	25.4%	-1.2%	23.9%
Other[4]	3,209	3,779	4,097	17.8%	8.4%	27.7%
Support Staff[5]	24,824	27,841	26,372	12.2%	-5.3%	6.2%

[1] Excludes therapists

[2] Includes staff developers, teacher trainers, athletic coaches, remedial specialists, other school-level instructional professionals, and therapists

[3] Includes principals, vice principals, directors, coordinators, supervisors, pupil personnel workers, school social workers, and other administrators

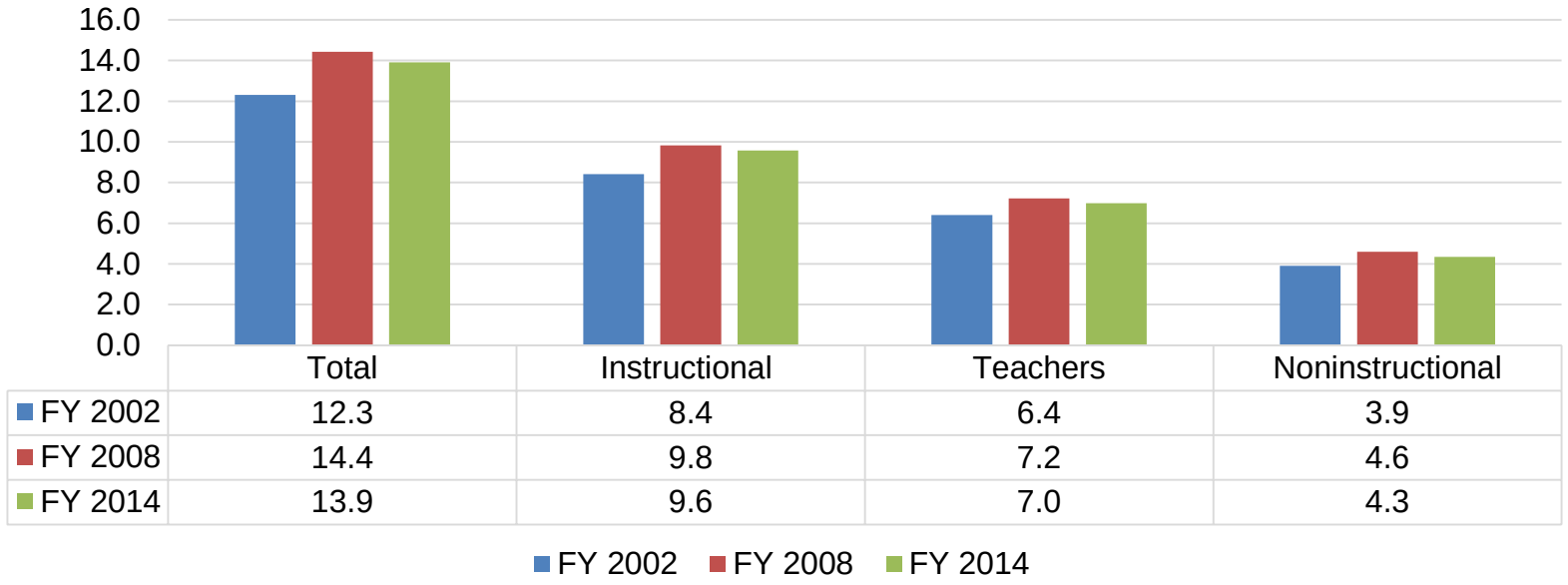
[4] Includes nurses, admission officers, research specialists, etc.

[5] Includes technicians, service workers, secretaries and clerks, drivers, crafts and trades personnel, laborers, etc.

Note: Includes the SEED School in fiscal 2014

Source: *Staff Employed at School and Central Office Levels, Maryland Public Schools* report, Maryland State Department of Education

Personnel per 100 Students Increases Since Fiscal 2002



	Total	Instructional	Teachers	Noninstructional
FY 2002	12.3	8.4	6.4	3.9
FY 2008	14.4	9.8	7.2	4.6
FY 2014	13.9	9.6	7.0	4.3

Note: Instructional staff includes teachers, therapists, media, guidance, psychologists, staff developers, teacher trainers, athletic coaches, remedial specialists, and other school-level instructional professionals.

Noninstructional staff includes principals, vice principals, directors, coordinators, supervisors, pupil personnel workers, school social workers, other administrators, nurses, admission officers, research specialists, technicians, service workers, secretaries and clerks, drivers, crafts and trades personnel, laborers, etc.

Includes the SEED School in fiscal 2014.

Source: *Staff Employed at School and Central Office Levels, Maryland Public Schools* report, Maryland State Department of Education; Department of Legislative Services

Number of Instructional Staff per 100 Students Increases

	Per 100 Students			Percent Change		
	FY 2002	FY 2008	FY 2014	FY 02-08	FY 08-14	FY 02-14
Total Instructional	**8.4**	**9.8**	**9.6**	**16.9%**	**-2.7%**	**13.8%**
Allegany	10.0	11.1	10.6	10.4%	-4.8%	5.1%
Anne Arundel	7.8	9.4	9.3	20.9%	-1.5%	19.1%
Baltimore City	8.8	10.6	9.0	20.4%	-14.7%	2.7%
Baltimore	8.4	9.2	8.8	9.3%	-4.1%	4.8%
Calvert	8.2	9.4	9.3	14.8%	-1.3%	13.2%
Caroline	8.7	9.8	10.8	13.0%	9.3%	23.5%
Carroll	7.3	9.0	9.5	23.6%	5.3%	30.2%
Cecil	8.0	10.3	10.0	28.7%	-2.6%	25.4%
Charles	7.9	9.5	9.5	19.9%	0.7%	20.7%
Dorchester	8.9	10.3	10.6	16.7%	2.4%	19.5%
Frederick	7.7	9.2	10.0	19.3%	8.5%	29.5%
Garrett	9.9	10.3	9.8	3.6%	-4.5%	-1.1%
Harford	8.2	10.1	10.8	22.6%	7.0%	31.2%
Howard	9.9	11.6	11.6	17.4%	-0.6%	16.8%
Kent	10.3	11.4	11.1	9.8%	-1.8%	7.8%
Montgomery	8.9	10.1	9.6	13.6%	-4.7%	8.3%
Prince George's	7.6	9.3	9.0	22.0%	-3.7%	17.5%
Queen Anne's	8.4	9.4	9.1	11.0%	-2.4%	8.3%
St. Mary's	8.2	8.9	8.8	9.1%	-1.1%	7.9%
Somerset	9.8	12.6	11.5	29.1%	-8.8%	17.8%
Talbot	9.3	8.7	9.3	-6.0%	6.5%	0.0%
Washington	8.6	9.3	9.2	7.5%	-0.8%	6.7%
Wicomico	9.9	11.2	11.0	13.6%	-1.8%	11.6%
Worcester	10.7	13.8	13.8	29.1%	-0.2%	28.8%

Note: Instructional staff includes teachers, therapists, media, guidance, psychologists, staff developers, teacher trainers, athletic coaches, remedial specialists, and other school-level instructional professionals. Total instructional includes the SEED School in fiscal 2014.

Source: *Staff Employed at School and Central Office Levels, Maryland Public Schools* report, Maryland State Department of Education; Department of Legislative Services

Average Teacher Salary Increased 33.8% Since 2002

	FY 02	FY 08	FY 14	% Change 02-08	% Change 08-14	% Change 02-14
Allegany	$43,056	$54,618	$62,618	26.9%	14.6%	45.4%
Anne Arundel	47,752	60,304	61,793	26.3%	2.5%	29.4%
Baltimore City	47,022	53,237	65,785	13.2%	23.6%	39.9%
Baltimore	47,875	57,639	60,906	20.4%	5.7%	27.2%
Calvert	49,837	65,336	73,755	31.1%	12.9%	48.0%
Caroline	42,836	53,462	55,110	24.8%	3.1%	28.7%
Carroll	48,024	58,786	56,670	22.4%	-3.6%	18.0%
Cecil	44,805	53,406	60,618	19.2%	13.5%	35.3%
Charles	45,481	56,154	59,864	23.5%	6.6%	31.6%
Dorchester	45,302	55,421	51,678	22.3%	-6.8%	14.1%
Frederick	46,716	60,141	62,904	28.7%	4.6%	34.7%
Garrett	42,145	55,083	59,392	30.7%	7.8%	40.9%
Harford	44,715	56,583	56,691	26.5%	0.2%	26.8%
Howard	49,048	61,897	68,233	26.2%	10.2%	39.1%
Kent	48,891	57,223	62,731	17.0%	9.6%	28.3%
Montgomery	55,043	70,011	74,353	27.2%	6.2%	35.1%
Prince George's	47,532	60,886	64,988	28.1%	6.7%	36.7%
Queen Anne's	43,965	52,611	58,241	19.7%	10.7%	32.5%
St. Mary's	46,187	57,096	62,085	23.6%	8.7%	34.4%
Somerset	42,040	52,321	53,062	24.5%	1.4%	26.2%
Talbot	42,428	53,111	58,276	25.2%	9.7%	37.4%
Washington	44,826	55,189	59,272	23.1%	7.4%	32.2%
Wicomico	43,692	55,184	57,432	26.3%	4.1%	31.4%
Worcester	45,648	57,361	60,252	25.7%	5.0%	32.0%
Statewide Average	**$48,251**	**$60,069**	**$64,546**	**24.5%**	**7.5%**	**33.8%**
Average Teacher Minimum[1]	**$31,940**	**$41,056**	**$43,375**	**28.5%**	**5.6%**	**35.8%**
Average Teacher Maximum[2]	**$63,090**	**$79,596**	**$85,477**	**26.2%**	**7.4%**	**35.5%**

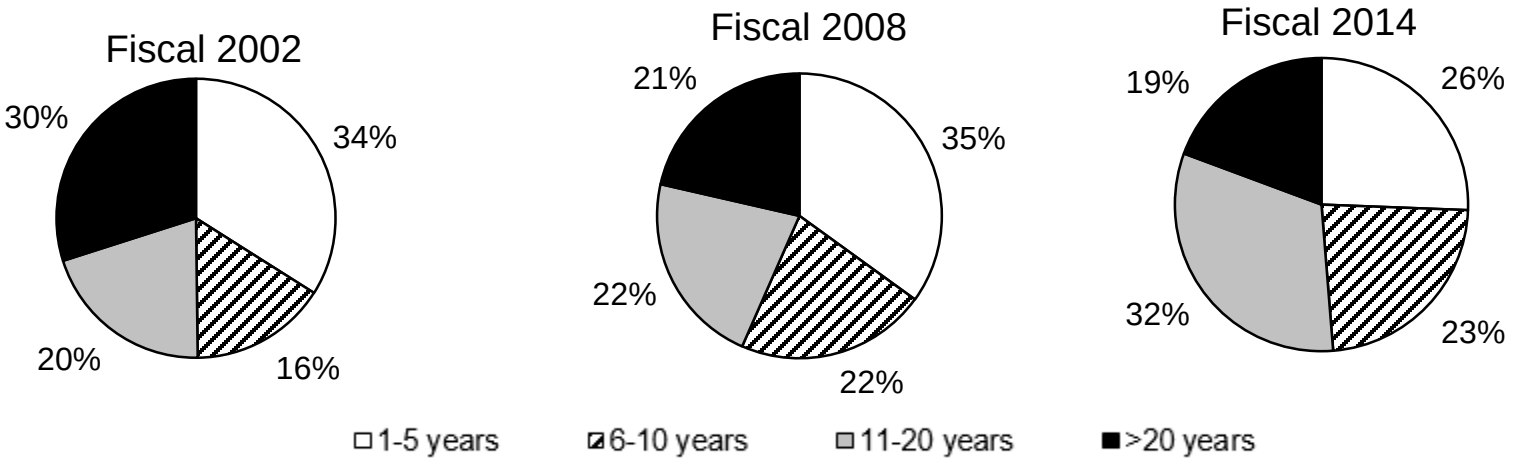
[1] Minimum is step 1 salary of teachers with a bachelor's degree.

[2] Maximum salary of teachers with a doctorate.

Sources: *Analysis of Professional Salaries* report and *Maryland Public Schools and Professional Salaries Schedules* report, Maryland State Department of Education

Years of Experience for Professional School-level Staff Generally Increases

Professional School-level Staff	FY 2002	FY 2008	FY 2014	Change (02-14)	% Change
With 1-5 Years Experience	19,618	27,506	19,973	355	1%
With 6-10 Years Experience	9,143	17,002	18,043	8,900	97%
With 11-20 Years Experience	11,692	17,304	24,921	13,229	113%
With >20 Years Experience	17,285	16,842	15,084	-2,201	-12%
Total School-level Staff	**57,738**	**78,654**	**78,021**	**20,283**	**35%**



Note: Professional school-level staff includes administrative office staff, pupil personnel workers, school social workers, principals, assistant principals, teachers, therapists, librarians, guidance counselors, and psychological personnel. Does not include central office staff.

Source: For fiscal 2002, *Characteristics of Professional Staff, Maryland Public Schools* report, and for fiscal 2008 and 2014, *Professional Staff by Type of Degree and Years of Experience, Maryland Public Schools* report, Maryland State Department of Education; Department of Legislative Services

Percent of Classes Taught by Teachers Who are Highly Qualified Increased Significantly Since Fiscal 2004

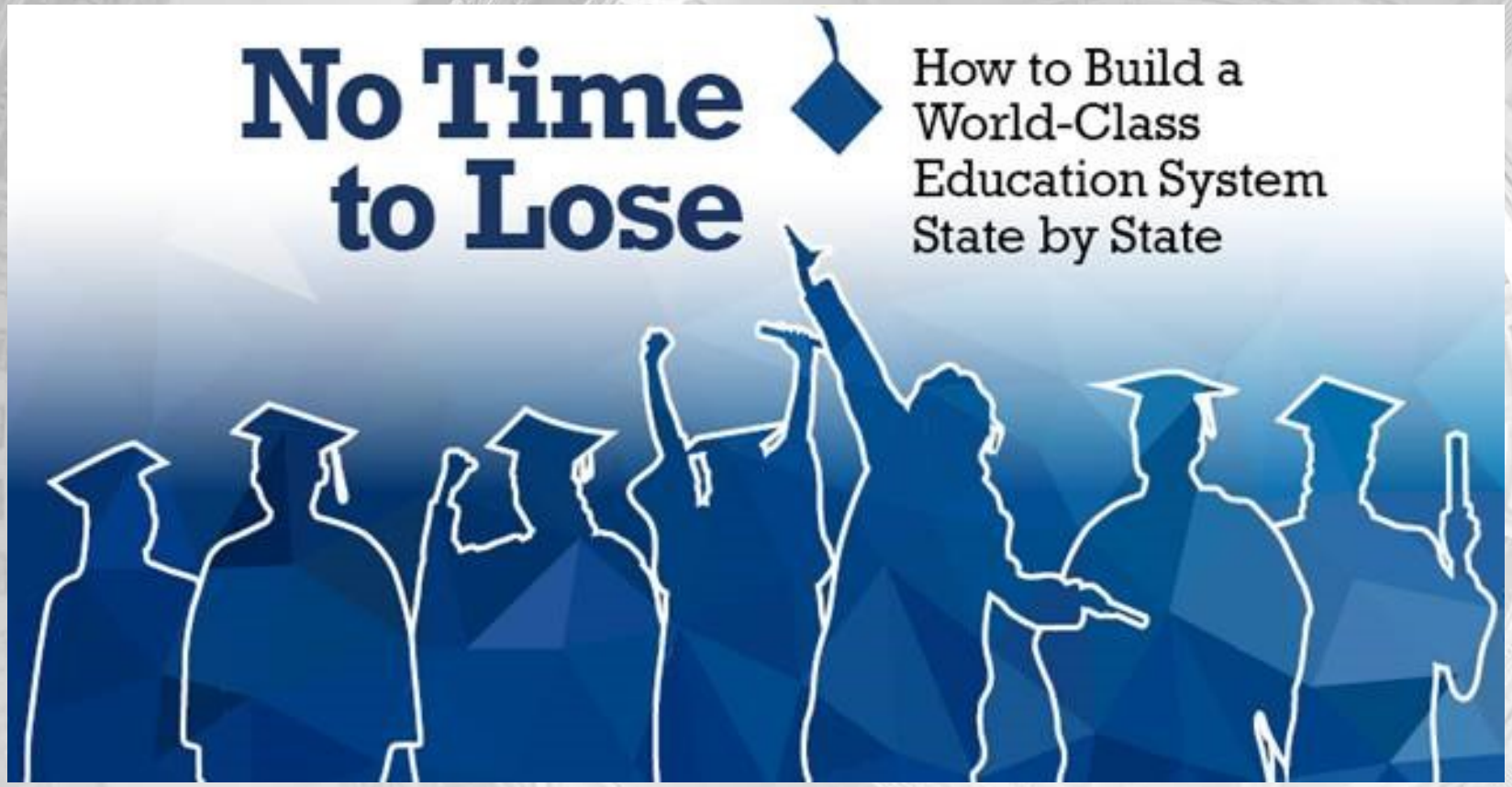
School System	FY 2004	FY 2008	FY 2014	Change (04-08)	Change (08-14)	(Change 04-14)
Allegany	85.0%	97.8%	99.3%	12.8%	1.5%	14.3%
Anne Arundel	82.2%	87.4%	93.5%	5.2%	6.1%	11.3%
Baltimore City	34.3%	51.1%	78.3%	16.8%	27.2%	44.0%
Baltimore	62.5%	88.5%	94.1%	26.0%	5.6%	31.6%
Calvert	77.7%	86.3%	94.7%	8.6%	8.4%	17.0%
Caroline	74.5%	95.4%	97.6%	20.9%	2.2%	23.1%
Carroll	86.9%	91.8%	93.9%	4.9%	2.1%	7.0%
Cecil	77.7%	93.1%	97.7%	15.4%	4.6%	20.0%
Charles	51.0%	91.0%	96.0%	40.0%	5.0%	45.0%
Dorchester	64.0%	79.7%	93.8%	15.7%	14.1%	29.8%
Frederick	65.5%	91.9%	96.5%	26.4%	4.6%	31.0%
Garrett	85.0%	94.9%	99.4%	9.9%	4.5%	14.4%
Harford	80.1%	86.6%	95.4%	6.5%	8.8%	15.3%
Howard	81.7%	89.6%	93.5%	7.9%	3.9%	11.8%
Kent	73.0%	94.2%	97.9%	21.2%	3.7%	24.9%
Montgomery	74.6%	92.5%	96.8%	17.9%	4.3%	22.2%
Prince George's	48.6%	73.0%	88.1%	24.4%	15.1%	39.5%
Queen Anne's	72.1%	82.6%	97.6%	10.5%	15.0%	25.5%
Saint Mary's	70.9%	92.9%	96.3%	22.0%	3.4%	25.4%
Somerset	60.5%	83.3%	95.0%	22.8%	11.7%	34.5%
Talbot	80.1%	96.4%	99.9%	16.3%	3.5%	19.8%
Washington	87.2%	90.1%	95.4%	2.9%	5.3%	8.2%
Wicomico	78.2%	88.8%	94.1%	10.6%	5.3%	15.9%
Worcester	79.3%	96.6%	96.1%	17.3%	-0.5%	16.8%
Total	**66.9%**	**84.6%**	**92.4%**	**17.7%**	**7.8%**	**25.5%**

Note: Data on highly qualified teachers only became available in 2004 as a result of the requirement in the No Child Left Behind Act.
Source: Maryland State Department of Education, *Maryland Report Card*; Department of Legislative Services

Practices that were Implemented With New Money

- The Bridge to Excellence Act of 2002 required a study to be completed assessing outcomes of the Act
  - MGT of America, Inc. was the selected contractor for the study
  - The study began in 2005 and was completed in 2008

- Several strategies were implemented
  - Higher salaries to be competitive
  - Hiring additional personnel
  - Professional development
  - Data analysis
  - Research-based programs
  - Academic intervention/acceleration
  - Differentiated instruction



MARYLAND COMMISSION ON INNOVATION AND EXCELLENCE IN EDUCATION

Julie Davis Bell
December 8, 2016

About NCSL

- Instrumentality of all 50 state and territorial legislatures
- Bipartisan
- Provides research, technical assistance and opportunities to exchange ideas
- Advocates on behalf of legislatures before the federal government

NCSL is committed to the success of state legislators and staff. Founded in 1975, we are a respected bipartisan organization providing states support, ideas, connections and a strong voice on Capitol Hill.

NCSL International Education Study Group -- 28 legislators and staff

- 22 legislators and 6 legislative staff
- Bipartisan, experienced state education leaders
- Eighteen months of work
  - Consulted experts
  - Studied 10 top performing countries/provinces
    (Alberta, Ontario, Estonia, Finland, Hong Kong, Japan, Poland, Shanghai, Singapore, Taiwan)
- Preparing for Phase II

Why Study Other Countries?

- Other countries are moving all students upward – US student achievement is stagnant.
- Top performing countries have strategically linked education reform to economic development and global competitiveness.
- Comparing other countries to the United States is imperfect but shouldn't be a reason to dismiss the PISA results or the relevance of lessons from other countries.
- States are responsible for ensuring high quality education and this is a state (not national or federal) problem.
- States compare relatively favorably with other countries than does the United States as a whole.
- There are lessons from other countries that are reasonable for states to consider.

Elements of High-Performing Systems:

Common Element #1

Children come to school ready to learn, and extra support is given to struggling students so that all have the opportunity to achieve high standards.

Elements of High-Performing Systems:

Common Element #2

A world-class teaching profession supports a world-class instructional system, where every student has access to highly-effective teachers and is expected to succeed.

Elements of High-Performing Systems:

Common Element #3

A highly-effective, intellectually rigorous system of career and technical education is available to those preferring an applied education.

Elements of High-Performing Systems:

Common Element #4

Individual reforms are connected and aligned as parts of a clearly planned and carefully designed comprehensive system.

Action Steps for States

- ✓ Build an Inclusive Team and Set Priorities.
- ✓ Study and Learn from Top Performers.
- ✓ Create a Shared Statewide Vision.
- ✓ Benchmark Policies.
- ✓ Get Started on One Piece.
- ✓ Work Through “Messiness.”
- ✓ Invest the Time.

How States are Moving the Conversation

- Bringing conversation about top performing countries to a broad group of citizens
- Bringing policymakers, educators and citizens together to identify a vision, priorities and opportunities for action
- Linking these conversations to major reform occurring in the state (ESSA, school finance reform)
- Conducting gap analyses
- Considering benchmarking
- Finding an entity for hosting/sponsoring this ongoing work

Study Group Phase 2

- Learn more about specific implementation strategies in the top performing countries (both technical policy approaches and navigating major policy change)
- Support state-based activity and study and learn about what works

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CENTER ON INTERNATIONAL EDUCATION BENCHMARKING

LEARNING FROM THE WORLD'S HIGH PERFORMING EDUCATION SYSTEMS

PISA 2015 Results for the US

Betsy Brown Ruzzi

Vice President

National Center on Education and the Economy

8 December 2016

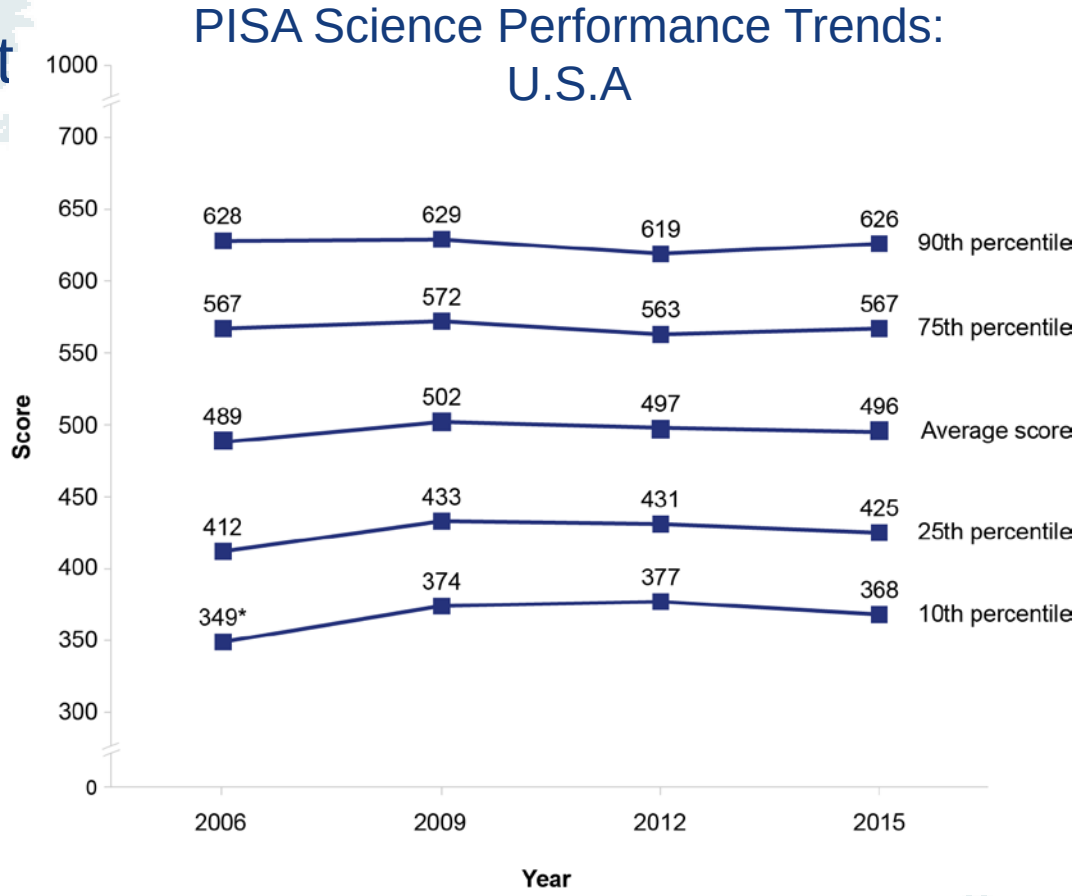
NCEE National Center On EDUCATION And The Economy

Overview of PISA

- PISA is administered every three years in
  - Reading
  - Mathematics
  - Science
- The focus for this administration of the exam was science:
  - How a student uses, applies and creatively extrapolates what they know about science in new contexts in addition to understanding the disciplines of science.

U.S. Performance on PISA

- U.S. average student performance in science and reading on the PISA 2015 assessment was flat.
- There was no significant change since 2012.
- This level of performance is at about the OECD average in those two subjects.



U.S. Performance on PISA

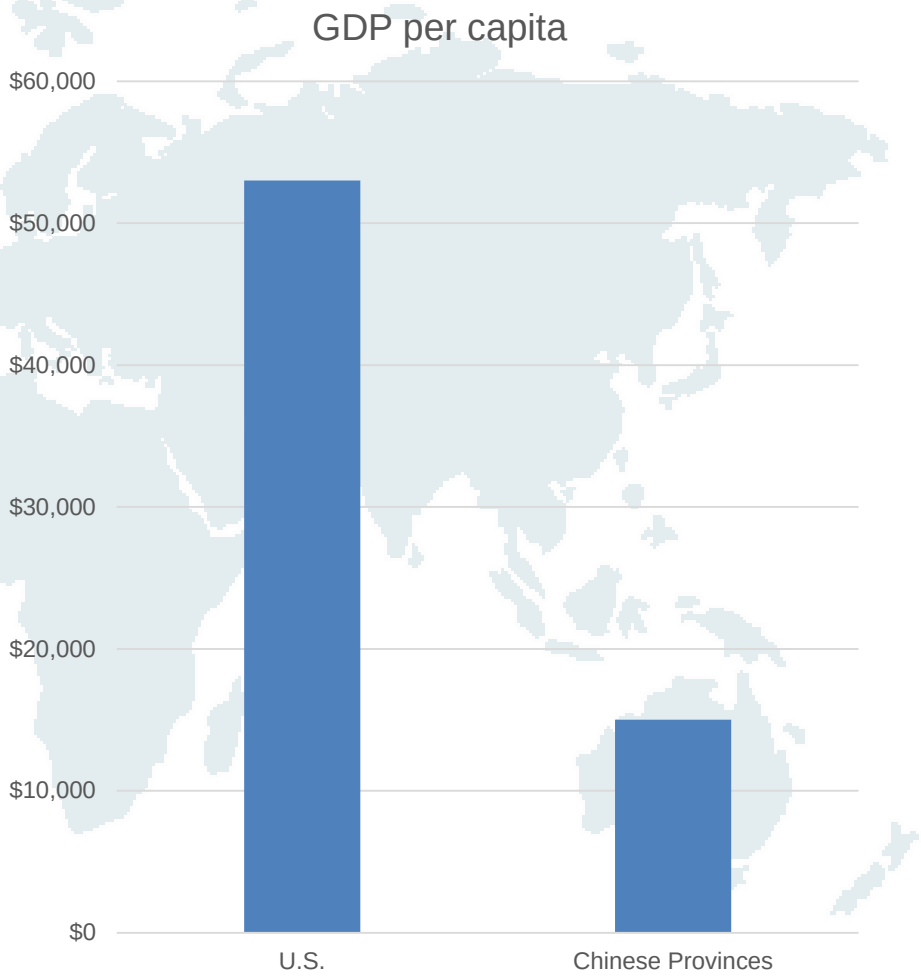
- Top performing students in the U.S. did better in science and reading, but their performance was offset by a decline in performance of the lower performers.
- One bit of good news is the change in the right direction of the impact of socioeconomic status on performance.
- In 2006, SES explained 17 percent of a student's science score and in 2015 it dropped to 11 percent.

Is this a Sputnik Moment?

- In addition to Shanghai, three provinces in China administered PISA 2015.
- If you combine the populations of these provinces, that population would be the fifth biggest in the world.
- These four provinces' students greatly outperformed U.S. 15 year olds in math (5th) and science (9th), with their average reading score about the same as US students.

U.S. and China: Comparison

- Average GDP per capita in the US is $53,000
- Average GDP per capita in the four provinces in China is less than $15,000
- And, on average, Chinese labor costs are 1/5th of US labor costs



Some Other Good News

- Massachusetts moves up in the rankings
- Only Singapore did better in science
- Massachusetts tied with Singapore for first in reading
- 11 systems scored higher in math

International Top Performers

- Germany, New Zealand and the Netherlands joined the top ranks.

- Estonia, Canada, Finland and top Asian nations remain in the top of the league tables.

Singapore

- A very high proportion of Singapore students perform at the highest level on PISA.

- In math, 35% are able to successfully respond to the toughest PISA problems compared to 6% of U.S. students.

Singapore

- A very high proportion of Singapore students are also in the top ranks in science.
- 24% in Singapore compared to 9% in the US.