

IN PURSUIT: EQUITY, ADEQUACY, AND AUTONOMY



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A Study of MNPS's Student-Based Budgeting Model

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in pursuit: equity, adequacy, and autonomy

A STUDY OF MNPS'S STUDENT-BASED BUDGETING MODEL

EXECUTIVE SUMMARY

Over the last decade, an increasing number of school districts have focused on school finance reform as a critical component of school improvement initiatives. One approach – known as student-based budgeting, student-based funding, or weighted student funding – focuses on the equitable distribution of funds within a district.

Metro Nashville Public Schools, who launched their student-based budgeting (SBB) initiative in the 2013-14 school-year, developed three specific goals for their SBB program:

- *Improve equity*: provide funding to schools based on differentiated student needs
- *Increase transparency*: increase visibility to school allocations, principal choices, and student achievement
- *Expand flexibility*: ensure school leaders have the flexibility to design their schools to best meet the needs of their students

In order to determine the impact of MNPS's student-based budgeting initiative over its initial years of implementation and school and district leaders' perception of the program, this report focused on the following research questions:

1. *Has the implementation of Student-Based Budgeting significantly increased equity between schools in the district?*
2. *Is there significant variation in student outcomes between schools that receive similar per-pupil allocations and serve similar student populations?*
3. *How have principals and district leaders responded to the SBB initiative?*
4. *How do other models of resource allocation compare to the use of resources in schools included in the MNPS SBB initiative?*

Methodology

To address these questions, we used a mixed methods approach, examining both qualitative and quantitative data from Metro Nashville Public Schools.

In order to determine the perspectives of various stakeholders within the district, we conducted semi-structured interviews with district leadership and school principals. Principals and schools were selected for the study through a return-on-investment (ROI) analysis, using each school's average per-pupil allocation and the state's value-added growth measures to determine the educational value per dollar spent at each school site. From the ROI analysis, we selected schools that had similar allocations but

significant variation in student outcomes. In particular, we focused on schools that received allocations that were similar to the district average, based on school-type.

To understand how schools, with similar budgets, allocate resources outside of the context of the SBB initiative, we also selected four charter management organizations (CMOs) to interview. The four sites that were selected are among the highest-performing charter management organizations in the district and represent all grade-levels and geographic quadrants within MNPS.

Finally, we completed a linear regression analysis in order to determine if the relationship between per pupil spending and student characteristics, including need, changed over the periods before and after implementation of the SBB policy.

Recommendations

Based on this analysis, we present the following recommendations to Metro Nashville Public Schools:

1. Develop a more robust training and support model for principals focused on school improvement strategies and goals.

Currently the district provides supports that align targeted school improvement priorities to the annual budgeting process. Consistent principal feedback reinforced that this process is, at times, seen as a compliance exercise with limited value to school improvement efforts. As a result, we recommend for MNPS to focus efforts on training and support for principals in order to re-orient their budgeting process towards effective planning for school improvement. This training could potentially focus on identifying specific areas of focus or priority, developing a theory-of-change to address the identified challenges, and monitoring implementation and effectiveness.

2. Focus principal's involvement in budgeting on high-impact decisions.

Given our interviews with district and charter leaders, we recommend giving district principals a narrower scope of high-impact budget decisions. While this recommendation operates in contrast to the idea of maximum autonomy for MNPS principals, this recommendation, coupled with training and support, could be more successful at driving school improvement and student outcomes.

3. Adjust the student-funding formula to account for the needs of schools serving English language learners, small schools, and schools with special programs.

Over the last two years, MNPS has increased the weight given to English Language Learners within the district's funding formula. Given this increase, based on our equity analysis, schools that serve a higher proportion of EL students still receive, on average, a smaller per-pupil allocation. If the district believes that a high concentration of EL students represents a significant additional need, MNPS should consider adding an additional weight or adjustment for these school sites.

In addition, both district and staff interviews revealed concerns regarding allocations for small schools and schools with special programs (such as STEM-focused middle schools and International Baccalaureate programs at the high-school level). Based on this considerable feedback, we recommend adjusting the

funding formula to provide additional resources to small schools (to support adequate staffing), and to schools with specific programmatic initiatives that were initiated at the district-level.

4. Address transparency of district spending to match current expectations for school spending.

Finally, MNPS should develop an accountability mechanism to provide transparency for central office spending which mirrors the expectations for individual schools. Principals and district staff saw this as an issue of fairness and uniformly reported that the intent of SBB was to increase transparency at all levels.

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A SHIFT TOWARD INTRADISTRICT EQUITY

Over the last decade, an increasing number of school districts have focused on school finance reform as a critical component of school improvement initiatives. One approach – known as student-based budgeting, student-based funding, or weighted student funding – focuses on “a more equitable and rational allocation of funds among students and schools with different levels and types of need” (Gloude-mans, 2010). While these programs vary considerably depending upon the school district and state context, many initiatives have similar goals. District student-based budgeting plans often include an emphasis on increasing flexibility for school leaders and increasing school-level accountability for student results.

In the 2013-14 school-year, Metro Nashville Public Schools (MNPS) initiated a Student-Based Budgeting (SBB) program in order to achieve three primary goals: to improve equity, expand flexibility, and increase transparency. The district hopes that student-based budgeting will “give principals and school leadership teams control over resources....to help improve the educational experience of [MNPS] students, and hold them accountable for managing these resources” (MNPS, 2016a).

Equity and Adequacy

One of the primary goals of MNPS's SBB initiative is to increase equity between schools that serve student populations with varying levels of need. While wealth equalization or compensatory funding strategies have frequently been enacted at the state and local level, intradistrict differences have rarely been recognized and remain “one of the greatest sources of inequality in American public school education” (Guthrie, Springer, Rolle, & Houck, 2007).

By creating a weighted funding formula based on the characteristics of individual students, MNPS is attempting to address vertical equity, distributing sufficiently greater resources to students with greater needs. Within the context of a vertical equity approach, sufficiently greater resources should be adequate for all students to achieve equal educational outcomes (Baker & Green, 2008).

As a result, the concepts of equity and adequacy are closely related when considering the impact of weighted student funding. In these models, the primary questions become “who requires differential treatment and how much?” (Baker & Green, p. 209).

Critics of student-based funding models have often cited concerns associated with the assignment of imperfect weights, or weights that are not commensurate with student need (Ladd, 2008). Overall, one of the greatest challenges in school finance has been the attempt to specify adequate educational opportunity. Guthrie and colleagues (2007) note that no method for determining adequacy constitutes a

'scientific' approach. They write, "All that can be claimed for them, pragmatically, is that they are better than guessing and better than uninformed political judgment" (p. 294).

Critics of SBB also note that allocations in weighted-student funding models are often based only on the needs of individual students, and ignore concentrations of disadvantage within schools, an increasing reality in large public-school systems in the United States (Ladd, 2008). In "Conceptions of Equity and Adequacy in School Finance," Baker and Green describe this challenge, noting that "individual student background attributes are but one small piece of a complex integrated puzzle....The specific educational needs of individual students interact with the composition of students' peer groups and with the context in which children are schooled. These factors affect comprehensively the costs of achieving specific educational outcomes" (2008, p. 211). In sum, the task of accurately determining student need and adequately weighting school allocations remains elusive.

Principal Empowerment and Autonomy

A second objective of MNPS's SBB model is to increase principals' discretion over spending at the school-level. This autonomy is granted to principals in order to increase leaders' control over school resources, while also creating a system in which leaders can be held increasingly accountable for student outcomes and results.

In *Modern Education Finance and Policy*, Guthrie et al. describe the need for increased principal autonomy, saying, "Most principals in America's public schools are not empowered to operate their schools....Central office officials, not principals, make most important decisions....Until principals are further empowered on these important dimensions, it is unlikely that America's schools will become more productive." (2007, p. 322).

However, in their chapter "Autonomous Schools: Theory, Evidence and Policy," Plank and Smith describe the potential challenges and pitfalls associated with increased principal autonomy. They note that many sources of variation in school performance are located at the school-level, citing talented principals, effective teachers, parental engagement, and a culture of high expectations as the primary drivers of achievement at schools that "beat the odds" (2008). However, the authors also cite research that suggests that "simply setting schools free and holding them accountable for results is not in itself sufficient to conjure the attributes of effectiveness into being" (p. 414). Plank and Smith note that "detaching schools from bureaucratic structures" will not, in itself, lead to significant improvement; schools will also require "intensive external support," focused on increasing local knowledge and capacity at the school-level.

"Detaching schools from the bureaucratic structures within which they are embedded may enable the most privileged or resourceful schools to strike out in new and positive directions, but the rewards of enhanced autonomy for less advantaged schools are uncertain at best."

- **Autonomous Schools: Theory, Evidence, and Policy (Plank & Smith)**

The Budgeting Process

In districts that implement a weighted student funding model, the budgeting process is another primary area of focus and consideration. By involving principals in budgeting and resource allocation, the process itself has the potential to improve the school's productivity (Guthrie et al., 2007). When used strategically, the budgeting process can focus the leadership team on "educational priorities in order to maximize student learning" (p. 218). However, in contrast, an ineffective budgeting process can create an unnecessary "drain" on school leaders' limited time and capacity, taking attention away from the core tasks of instructional leadership.

Guthrie et al. (2007) stress the importance of this process, describing budgeting as the "practical bridge between planning and evaluation" (p. 220). They describe school-level budgeting as a continuous process which involves consistent monitoring of implementation and tracking of the school's progress towards prioritized goals. The authors write, "Like many other processes, the budget process is as important as the final result of the printed budget document....The budget itself should not be seen as the starting point or ending point, or as a separate activity from planning and evaluation" (p. 220).

METRO NASHVILLE PUBLIC SCHOOLS

It is within this context, that Metro Nashville Public Schools' SBB initiative is situated. This year (2017-18), the district has an operating budget of nearly \$900 million, half of which is directly allocated to schools through the district's student-based budgeting formula.

Metro Nashville Public Schools (MNPS), is one of the 50 largest public school districts in the country, currently serving almost 90,000 K-12 students. Currently, 51% of MNPS students are economically disadvantaged, 19% receive English language services, and 66% are African-American or Latino (Tennessee Department of Education, 2017)

MNPS began their student-based budgeting initiative with a pilot of 15 schools in the 2013-14 school-year, expanded to 55 schools in year two, and fully implemented the program across the district in the 2015-16 school-year, with 139 participating schools. Within MNPS, student-based budgeting includes both a needs-based allocation (based on student weights) and school-level flexibility, afforded to principals through the budgeting process. In order to determine a school's budget and allocation, the district begins with a base weight for each student, set at \$4,425 in the 2017-18 school-year. From there, the district uses a system of weights in order to provide additional dollars for students who have low prior academic performance, English learners, economically disadvantaged students, and students with exceptionalities. (At the elementary level, past academic performance is used as a proxy for poverty). The weighted formula for this school-year, and each previous year is included in Appendix A.

Program Theory and Logic Model

The MNPS Request for Assistance (RFA) identifies student achievement growth as the primary long-term outcome of the SBB initiative. The RFA also describes the underlying logic of the MNPS SBB model, noting connections between model components and short-term outcomes. According to the RFA, the use of a

needs-based funding formula will result in a more equitable allocation of resources, increased transparency will “encourage community involvement and increase accountability for resource decisions at the school level,” and increased principal autonomy will allow school leaders “to tailor the school budget to meet the needs of their students” (MNPS, 2017).

In addition to these explicitly-stated outcomes, several other theories undergird the student-based budgeting model in MNPS. In particular, the Director of Resource Strategy emphasized the importance of principal training and support, and its role in achieving the broader outcomes associated with student-based budgeting. In particular, the district office believes that in order for the SBB initiative to be successful, school budgets and expenditures must be aligned to the district’s strategic priorities and individual school improvement plans. The district office also believes that many principals are in need of robust training and support in order to effectively align budget decisions with these priorities. As a result, the district has included professional development for school leaders as a key component of SBB implementation and provides individual feedback to principals during the budgeting process. Through this work, the district hopes that principals will feel prepared and supported to make effective decisions with regard to school design and resource allocation. Appendix B (MNPS Student-Based Budgeting Logic Model) provides a more detailed overview of the program theory, including district-level inputs, activities, and outcomes.

Assumptions of the Model

Several assumptions are reflected in MNPS’s program theory and program design. First, MNPS assumes that by giving principals the ability to allocate budget resources, school leaders will have the flexibility needed to make significant changes to program or staffing. When operating under this assumption, a better-resourced school could hire additional staff, provide more effective professional development, increase instructional time, or provide more robust wrap-around services. However, it is possible that other barriers may prevent programmatic or staffing changes, such as restrictions on school schedules or course requirements.

A second critical assumption is that principals are best-equipped to make decisions about resource allocation. In this model, principals must have the skills and knowledge to understand the challenges in their schools, design interventions to address these challenges, and properly allocate resources to compensate for them. As a result, we explicitly explored this assumption in our inquiry, as it is fundamental to the success of the district’s SBB model.

One final assumption of MNPS’s student-based budgeting model is that per-pupil allocations, distributed based on the SBB weighting formula, will be adequate to meet the needs of MNPS schools and students. If school allocations are not adequate, factors such as principal skill and knowledge, spending flexibility, and increases in per pupil expenditure would yield little impact on student achievement outcomes.

External Factors

Over the last twenty years, significant shifts have also occurred in the district's enrollment and diversity. MNPS schools have experienced an increase in the proportion of economically disadvantaged students and a significant decrease in the number of white students attending the city's schools. Simultaneously the number of English language learners in the district has increased significantly; today, almost 20% of students in MNPS receive EL services and support (Tennessee Department of Education, 2017). As the student population in MNPS becomes increasingly high-need, the district may need to consider how these changing demographics impact their approach to resource allocation and the SBB model.

RESEARCH DESIGN AND METHODOLOGY

In order to determine the impact of its student-based budgeting initiative, MNPS has already completed an initial descriptive analysis and shared this work with our research team. Through this analysis, the district found that schools' flexibility varies based on school type. Because of district requirements on expenditures such as personnel, class size ratios, and leadership stipends, on average, elementary school principals only have flexibility with 7% of their total budget. High schools, on the other hand, are able to flexibly allocate 37% of their budget.

Despite this variation, in a principal survey, school leaders reported positive feedback on the implementation of SBB. Over 90% of principals reported that the SBB process was "valuable" and aligned to the district's strategy for school improvement. The question that received the lowest overall score on the survey related to school leader flexibility. Approximately 25% of principals reported that they were not given sufficient autonomy in order to address the "unique needs of my students and staff" (MNPS, 2016a).

Based on these initial findings, the district expressed interest in further understanding the perceptions of various stakeholders involved in SBB, including principals and district staff. The district also expressed interest in understanding the relative efficacy of the weighted funding formula and the impact of SBB on funding distribution and student outcomes. Given this context, we employed a mixed-method design, focused on the four research questions described below.

Research Question #1: Equity

Has the implementation of Student-Based Budgeting significantly increased equity between schools in the district? Specifically, has the Student-Based Budgeting initiative led to significant changes in the allocation of funds to schools with a history of low academic performance or a significant proportion of economically disadvantaged students?

Prior to the start of our research, the district had already completed two equity-focused analyses; the first examined the relationship between allocations and the district's academic performance framework, and the second examined the relationship between allocations and the percentage of economically disadvantaged students. However, the district did not determine if these relationships changed since the implementation of student-based budgeting or varied over the three years of implementation. As a result, we conducted a quantitative analysis to determine if the relationship between per pupil spending and

student characteristics, including need, changed over the periods before and after implementation of the SBB policy.

Research Question #2: Student Achievement

Is there significant variation in student outcomes between schools that receive similar per-pupil allocations and serve similar student populations?

The student-based budgeting initiative was first implemented district-wide in the 2015-16 school-year. Because there was no end-of-year state assessment administered in the 2015-16 in grades 3-8, the impact of the initiative on student-achievement has been especially difficult to determine. As a result, we conducted a return on investment (ROI) analysis, using each school's average per-pupil allocation and the state's value-added growth measures to determine the educational value per dollar spent at each school site.

Our goal was to determine if there was variation in student outcomes for schools that received similar per-pupil allocations with similar student populations. Using data from this ROI analysis, we identified schools that for each dollar spent, had the greatest impact on student achievement, and those that had a more minimal impact on student outcomes. A subset of these schools were selected as case studies for our qualitative analysis, described below.

Research Question #3: Principal Perceptions

How have principals responded to the SBB initiative? How do principals describe their experiences implementing SBB in their schools? For example, has the initiative impacted principal decision-making at the building level? What recommendations do principals have for the SBB at the district-level?

At the school sites identified through our ROI analysis, we conducted semi-structured interviews with principals in order to understand the nature of the relationship between the Student-Based Budgeting initiative and principal practices. Through these interviews, we sought to understand how principals perceive the SBB initiative and the approaches principals take to budgeting and resource allocation at the school-level. We also conducted interviews with district staff who support principals as they create their budgets and align allocations to their school improvement plans.

Research Question #4: Alternative Models

How do other models of resource allocation compare to the use of resources in schools included in the MNPS SBB initiative?

To understand how other schools, with similar budgets and student populations, address student need and allocate resources outside of the context of the SBB initiative, we conducted case studies in a subset of public charter schools in Nashville. These charter schools operate in an autonomous budgetary policy context in which school leaders exercise significant discretion with regard to allocations and spending. We conducted semi-structured interviews with a convenience sample of four charter school leaders, who

operate high-performing schools in the district as measured by value-added growth outcomes and achievement on state assessments.

EQUITY ANALYSIS

Has the implementation of Student-Based Budgeting significantly increased equity between schools in the district?

To examine this research question, we used a linear regression procedure examining key variables over a four-year period from the 2013-14 to 2016-17 school-year.

Our study examined the relationship between weighted student funding and gender, race, poverty, and the proportion of English language learners at each school. One hundred of the 139 participating schools in MNPS were included in the analysis; schools were excluded if any data was incomplete for the four years of SBB implementation, if the school was an alternative model (such as the MNPS Virtual School), or if the school was launched after the 2013-14 school-year. In order to complete the regression analysis, we first conducted bivariate correlations for all variables of interest, examining the overall model across the four years of implementation to identify any relative effect of key predictor variables. Finally, we conducted within-school year regression analyses to examine the change over time in effect size in key predictor variables (or covariates).

Key Variables

For the 111 schools included in our sample, we calculated the percent female students, percent racial minority (non-white) students, percent economically disadvantaged students, and percent English language learners (ELL) in each school. Raw data were provided by the district for each school and simple proportions were calculated for each variable in each of the four years. To examine within-school year effects and the changing impact of independent variables over time, we created a dummy variable for each school-year data set.

The dependent variable in our analysis was each school's average per-pupil allocation, calculated for each year of SBB implementation. In order to standardize each school's per-pupil expenditure over time, our team converted each school's allocation to a standard weighted measure from the base allocation for each year. (For example, the base per-pupil allocation in the 2016-17 school year was \$4,347. If a school received an average of \$5,000 per student, this was converted to a weighted score of 1.150).

Results of Equity Analysis

Descriptive Statistics

Based on the data provided by MNPS, we were able to obtain four years of complete data for 111 schools participating in the student-based budgeting model. Descriptive statistics for the schools included in our analysis are presented in the table below.

Table 1

Descriptive Statistics for the Sample of Schools over Four Years (N = 111)

	Minimum	Maximum	Mean	SD
Percent ELL	.00	.64	.15	.16
Percent Female	.41	.67	.49	.03
Percent Minority	.12	1.00	.68	.21
Percent Low-income	.02	.96	.52	.21
Weighted School Funding	1.00	2.96	1.51	.32

Bivariate Correlations

Variables of interest in the present model were all calculated at the school level. They included average weighted per-pupil expenditures, percent female students, percent minority students, percent low-income students and percent English language learner students. Initially, we calculated bivariate correlations between the variables of interest to identify any covariance. Table 2 summarizes this correlation matrix.

Table 2

Pearson Correlation Matrix among Key School Variables (N = 100)

	Percent Female	Percent Minority	Percent Low-income	Percent ELL	Weighted School Spending
Female		.007	-.17**	-.20**	-.05
Minority			.80**	.24**	.31**
Low-income				.35**	.41**
ELL					-.12**
Weighted School Funding					

**p < 0.01

The strongest positive correlations in the variables of interest include those between percent low-income and percent minority (non-white) ($r = .80^{**}$) and; between weighted school funding and percent low-income ($r = .41^{**}$). Interestingly, weighted school spending and percent ELL students was negatively correlated ($r = -.12^{**}$) indicating that schools with higher proportions of English language learners receive, on average, a smaller per-pupil allocation.

Regression Model

The second step in analyzing the relationship between student characteristics and weighted school funding was to examine the overall regression model for the four school years of SBB implementation. The four years account for the sample size in the present analysis ($N = 444$). Table 3 summarizes the results of the overall regression model and primary effect.

Table 3

Regression Model Estimating Effects of Student Characteristics on Weighted School Funding ($N = 444$)

Variable	B	SE B	β
Constant	1.29	.22	
Percent Female	-.54	.43	-.02
Percent Minority	.05	.11	-.07
Percent Low-Income	.71	.11	.57**
Percent ELL	-.66	.09	-.30**

$R^2 = .26$
 $F = 35.09^{**}$

* $p < .05$, ** $p < .01$

The overall model effect was significant ($F(4, 439) = 36.30, p = .00$) with a modest overall model fit ($R^2 = .25$). Percent low-income students and percent ELL students were the strongest predictors of weighted per-pupil spending although the latter relationship was not in the expected direction. We explore this finding in greater detail in the final set of regression analyses. This procedure does however suggest that the proportion of low income students is associated with an increase in weighted school funding, significant at conventional levels.

Regression: Year-to-Year Comparisons

The final component of the equity analysis was to examine the relationship between student characteristics and weighted school funding within each school year, and to examine changes in the relationship between those factors over the four years of SBB implementation from the 2013-14 school-year through 2016-17.

First we examined school year 2013-14. Table 4 summarizes the results of the regression model and main effect.

Table 4

Regression Model Estimating Effects of Student Characteristics on Weighted School Funding for School Year 2013-14 (N = 111)

Variable	B	SE B	β
Constant	1.21	.44	
Percent Female	-.12	.86	-.01
Percent Minority	.00	.21	.00
Percent Low-Income	.88	.26	.49*
Percent ELL	-.79	.19	-.38**

$R^2 = .26$
 $F = 9.21^{**}$

*p < .05, **p < .01

As expected, the proportions of low income and ELL students accounted for model significance. However, the proportion of ELL students related to weighted per pupil expenditure was in the unexpected direction, meaning that increased proportions of ELL students were associated with decreased additional funding. Next, we examined school year 2014-15. Table 5 summarizes the results of the regression model and main effect.

Table 5

Regression Model Estimating Effects of Student Characteristics on Weighted School Funding for School Year 2014-15 (N = 111)

Variable	B	SE B	β
Constant	1.08	.44	
Percent Female	.21	.89	.02
Percent Minority	-.19	.22	-.13
Percent Low-Income	.84	.22	.60**
Percent ELL	-.76	.17	-.40**

$R^2 = .26$
 $F = 9.22^{**}$

*p < .05, **p < .01

Next, we examined school year 2015-16. Table 6 summarizes the results of the regression model and main effect.

Table 6

Regression Model Estimating Effects of Student Characteristics on Weighted School Funding for School Year 2015-16 (N = 111)

Variable	B	SE B	β
Constant	1.35	.46	
Percent Female	-.21	.91	-.02
Percent Minority	-.37	.22	-.26
Percent Low-Income	1.07	.23	.75**
Percent ELL	-.54	.17	-.28**

$$R^2 = .28$$

$$F = 10.15**$$

*p < .05, **p < .01

Again, the proportion of low income students predicted higher weighted student funding but the proportion of ELL students was associated with lower weighted student funding. Fourth and finally, we examined school year 2016-17. Table 7 summarizes the results of the regression model and main effect.

Table 7

Regression Model Estimating Effects of Student Characteristics on Weighted School Funding for School Year 2016-17 (N = 111)

Variable	B	SE B	β
Constant	1.32	.39	
Percent Female	-.03	.78	-.003
Percent Minority	-.53	.22	-.34
Percent Low-Income	1.37	.22	.91**
Percent ELL	-.51	.16	-.26**

$$R^2 = .39$$

$$F = 16.82**$$

*p < .05, **p < .01

Overall, there are several notable findings and trends in the present analyses. First, overall model fit remains relatively stable for the first three years of implementation ($R^2 = .25$ to $.26$) and then increases in school year 15-16 to ($R^2 = .28$) and in 16-17 increases to ($R^2 = .39$) suggesting the factors in the final model account for more variance as time goes on. This may be attributable, in part, to adjustments in the SBB model, which have occurred each school-year. For example, the ELL weight increased from .10 per student in 2013-14, to .21 in 2016-17. MNPS's weighted model for each year of implementation can be found in Appendix B.

The standardized beta coefficient for percent low income students also steadily increases and becomes more significant over the four-year period (from $\beta = .49^*$ in 13-14; to $\beta = .60^{**}$ in 14-15; to $\beta = .75^{**}$ in 15-16, to $\beta = .91^{**}$ in 16-17). This upward trend suggests that over time, increases in the number of low income students in schools is associated with increased per-pupil allocations. This bodes well for MNPS's efforts to allocate funding based on student need. However, during this period MNPS did not have a specific weight for low income students. Instead, they used prior academic performance as a proxy for poverty; each student that scored below academic proficiency in the prior school year received an additional .10 of base PPE funding. In the 2017-18 academic year, MNPS did add an additional low-income weight of .05. Future analyses may determine the impact of this additional weight.

The final notable trend in the analysis is the unexpected relationship between an increased percentage of ELL students in schools and decreased weighted school funding. Over the four-year period, the relationship persists in this unexpected direction and accounts for less model variance over time ($\beta = -.38^{**}$ in 13-14; to $\beta = -.40^{**}$ in 14-15; to $\beta = -.28^{**}$ in 15-16, to $\beta = -.26^{**}$ in 16-17). This is particularly puzzling because the ELL weight increased between the 15-16 school year from .10 to .21 in the 16-17 school year.

Understanding Significance

The regression analysis described above indicates that through the SBB model, the district has successfully increased equity for schools serving higher proportions of economically disadvantaged students, reaching statistical significance in the 2016-17 school-year. However, this analysis does not tangibly demonstrate how an average school was impacted by these shifts over time and the degree to which equity has increased in the district.

As a result, we conducted an additional round of analyses, graphing the relationships between key variables over the four years of the student-based budgeting initiative. The graphs included below demonstrate the relationship between schools' average per-pupil expenditures and the following variables of interest: percent economically disadvantaged, percent English Language Learners, and percent minority. The tables included with each graph also describe how an average school's allocation would change over the four-years of SBB implementation.

Exhibit 1. Average Per-Pupil Expenditure by Percent Economically Disadvantaged

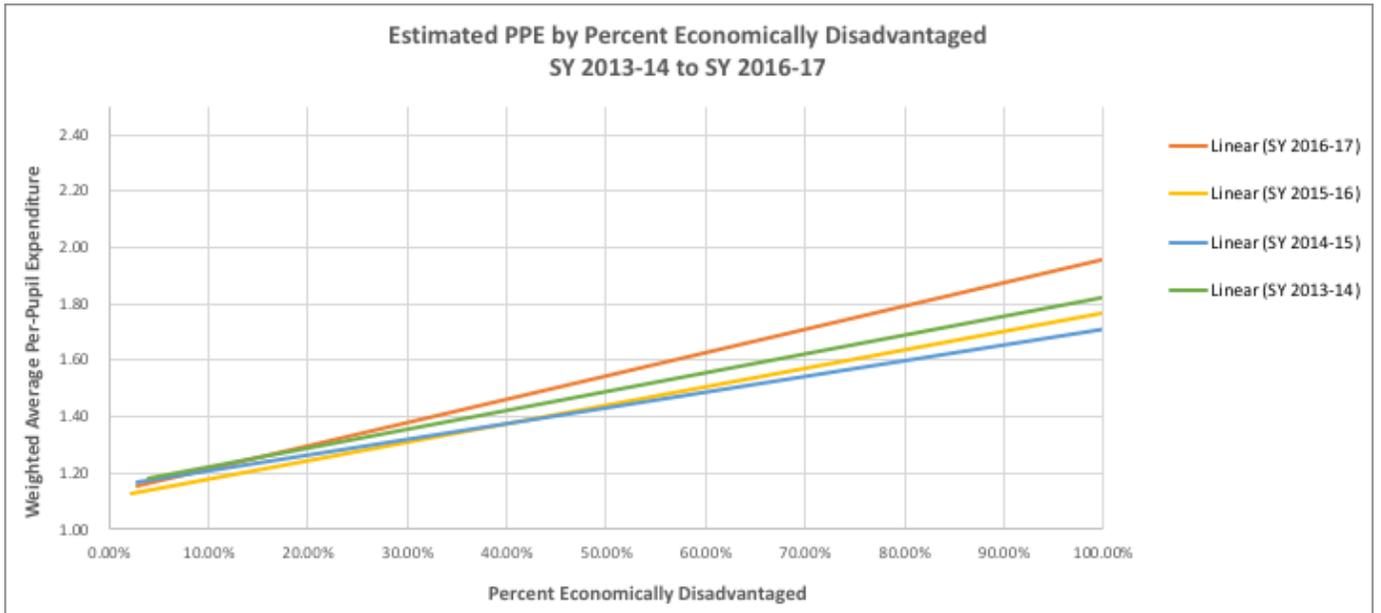


Table 8

Estimated Allocations: Percent Economically Disadvantaged

School Year	Regression Coefficient	R-Squared	25% ED: Estimated PPE	50% ED: Estimated PPE	75% ED: Estimated PPE
2013-14	.67	.14	\$5,531	\$6,231	\$6,927
2014-15	.56	.15	\$5,423	\$6,008	\$6,593
2015-16	.66	.22	\$5,413	\$6,108	\$6,804
2016-17	.83	.31	\$5,823	\$6,721	\$7,619

This analysis indicates that schools serving a higher proportion of economically disadvantaged (ED) students have experienced a significant increase in per-pupil allocation. If a school serves a student population that is 75% economically disadvantaged, it would receive approximately \$1,100 more per student in 2016-17 than in the 2014-15 school-year.

In addition, this analysis demonstrates that the relationship between per-pupil expenditures and the percentage of economically disadvantaged students, decreased significantly between 2013-14 and 2014-15. Since that time, the relationship increased steadily, with a significant shift occurring between the 2015-16 and 2016-17 school-years.

Exhibit 2. Average Per-Pupil Expenditure by Percent English Language Learners

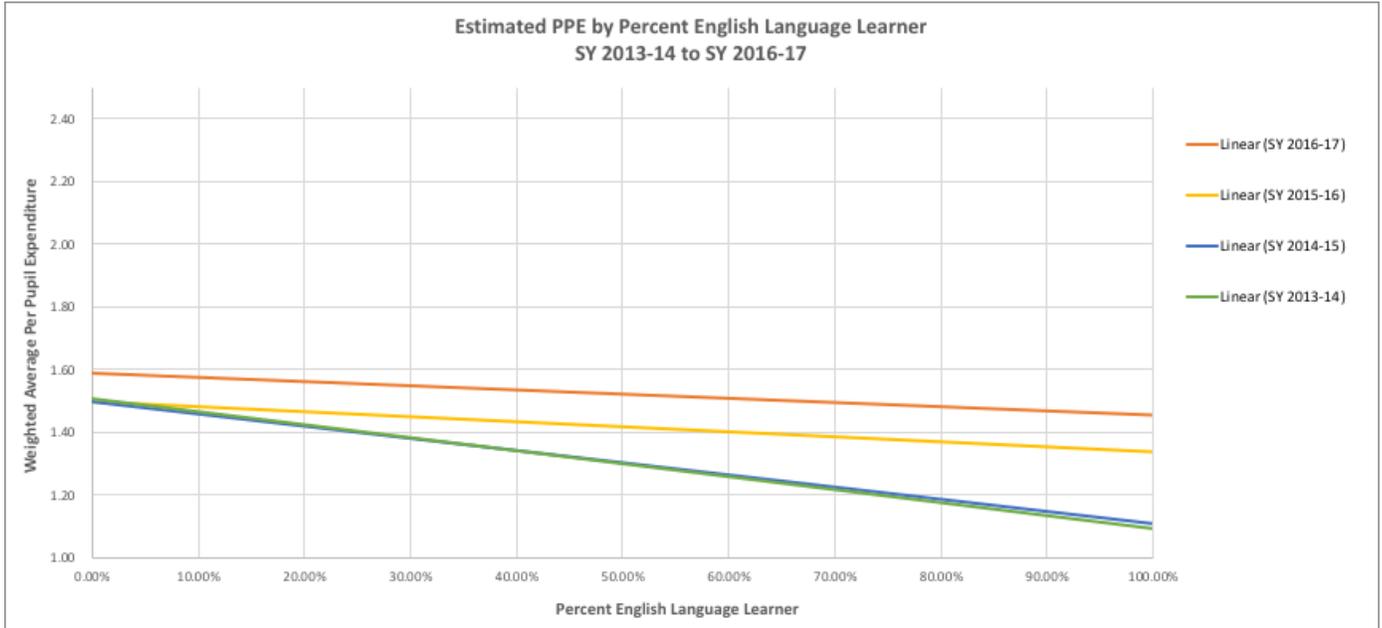


Table 9
Estimated Allocations: Percent English Language Learners

School Year	Regression Coefficient	R-Squared	25% ELL: Estimated PPE	50% ELL: Estimated PPE	75% ELL: Estimated PPE
2013-14	-.42	.04	\$5,895	\$5,459	\$5,023
2014-15	-.39	.04	\$5,891	\$5,482	\$5,074
2015-16	-.16	.007	\$6,187	\$6,018	\$5,848
2016-17	-.13	.005	\$6,764	\$6,619	\$6,474

Similar to the results reported in the previous section, this analysis reveals the negative relationship between per-pupil allocations and the percentage of English language learners in a school. This analysis also reveals that the average school has received a significant increase over the four-years of SBB implementation. For example, a school in which 50% of the students receive EL services would have received an estimated \$5,895 per student in 2013-14, compared to \$6,764 in 2016-17.

Of particular interest, though, is the fit of this relationship (with a reported R-squared of .005 in 2016). This indicates that there is significant variation in allocations to schools based on the proportion of students qualifying for EL services. As a result, the model of best fit indicated in the graph above is, in reality, a poor representation of the relationship between these variables.

Exhibit 3. Average Per-Pupil Expenditure by Percent Minority

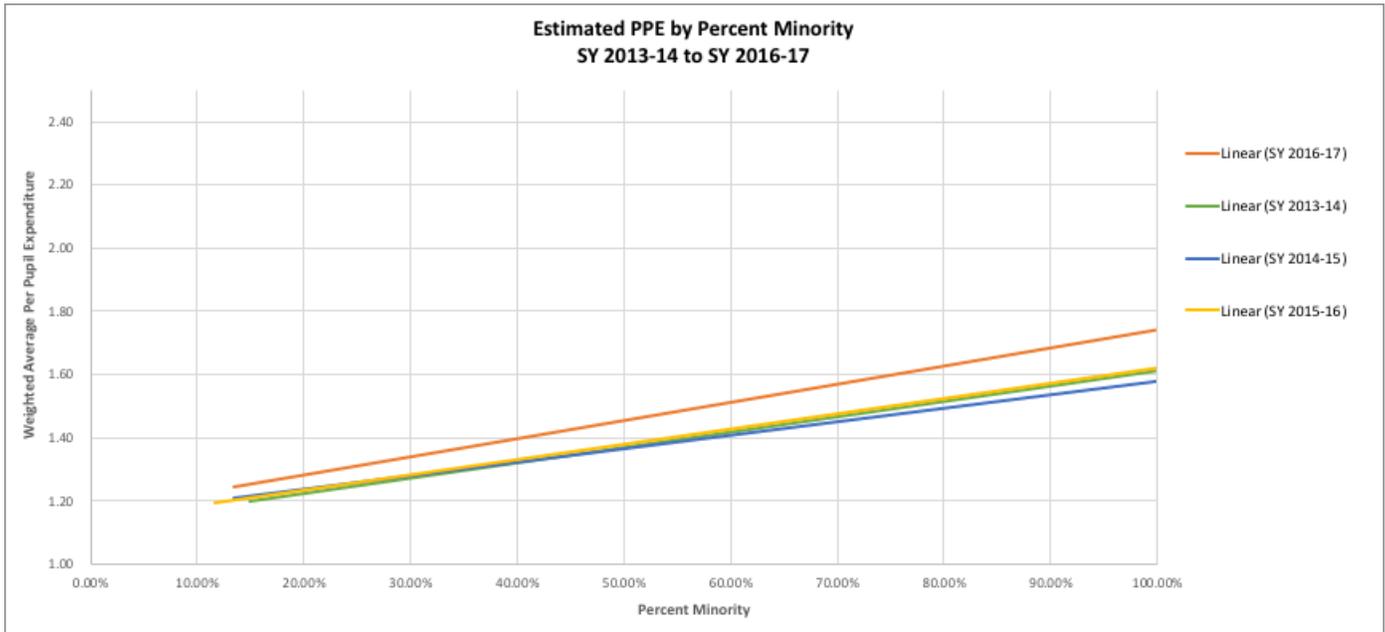


Table 10

Estimated Allocations: Percent Minority

School Year	Regression Coefficient	R-Squared	25% Minority: Estimated PPE	50% Minority: Estimated PPE	75% Minority: Estimated PPE
2013-14	-.42	.04	\$5,895	\$5,459	\$5,023
2014-15	-.39	.04	\$5,891	\$5,482	\$5,074
2015-16	-.16	.007	\$6,187	\$6,018	\$5,848
2016-17	-.13	.005	\$6,764	\$6,619	\$6,474

Like the relationship described between PPE and percent ED, this analysis also reveals a similar increase over time. The relationship between school-allocations and the percentage of minority students remained steady over the first three years of SBB’s implementation. In 2016-17, schools serving a higher proportion of minority students received a significant increase in their per-pupil allocation increase. A school serving a 75% minority student population, would have received an increase from \$5,848 in 2015 to \$6,474 in the 2016-17 school-year.

However, similar to the EL model above, the fit of this relationship (with a 2016-17 R-squared of .005) indicates that this model is also not a strong representation of the relationship between these two variables.

PRINCIPAL AND STAFF INTERVIEWS

Interview Site Selection

In order to select schools and principals for qualitative interviews, we conducted a return on investment (ROI) analysis, using each school's average per-pupil allocation and value-added growth score (TVAAS) from the 2016-17 school year. This analysis was used to calculate the educational value, per dollar spent at each school, and to determine if there was variation in student outcomes for schools that received similar per-pupil allocations with similar student populations.

In order to standardize each school's per-pupil expenditure over time, our team converted each school's allocation to a standard weighted measure from the base allocation for each school year (described in the previous section).

For middle schools and high schools, we used each school's composite value-added index score, including student outcomes from the end-of-year state assessments in English/Language Arts, Science, and Math. Typically, TVAAS scores are reported on a 1-5 scale; Level 4 and 5 indicate that a school has exceeded expected growth, Level 3 indicates that the school has made expected growth, and Levels 1 and 2 indicate less than expected growth. In the 2016-17 school-year, overall, MNPS schools scored a Level 1, and a majority of schools had negative growth index scores. As a result, in order to understand the variation between schools with composite scores of 1 or 2, for this analysis, we used each school's actual growth score (or index score). Because each school's value-added score takes into account a student's prior academic performance over multiple years, the value-added outcome provides a consistent measure of each school's performance that is unrelated to a student's demographics or background.

In the 2015-16 school-year, the state assessment was not administered due to challenges associated with the implementation of the state's online assessment platform. As a result, value-added scores were not reported for elementary school students in the 2016-17 school-year, as no prior academic performance data was available for students in grades 3 and 4. For the purpose of this study, student achievement data was substituted for value-added scores at the elementary level.

From the ROI analysis, we identified schools to serve as case studies for our analysis, primarily focusing on schools that had similar allocations but significant variation in student outcomes. In particular, we focused on schools that received allocations that were similar to the district average, based on school-type. We excluded magnet schools and schools with student populations that were dissimilar to the district as whole. This included rural schools and schools without a significant number of economically disadvantaged or minority students. We also based our selection on the location of schools within the geographically-based MNPS quadrant system. The ROI analysis is included in Exhibits 4-6, below.

Exhibit 4: Return-On-Investment Analysis, Middle Schools

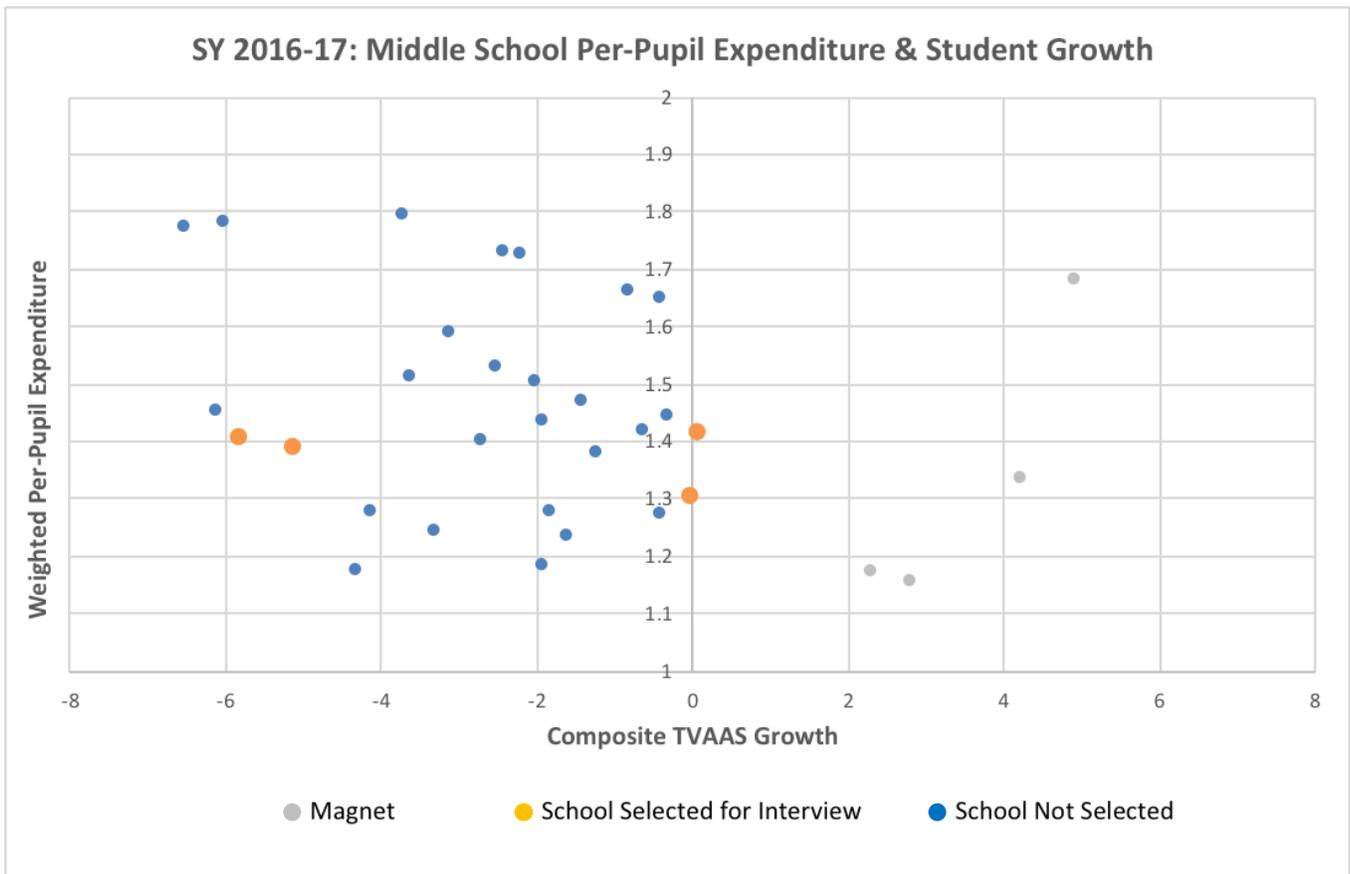


Table 11 summarizes relevant data for selected middle school sites.

Table 11
Middle Schools: Case Study Sites

Case Study Site	Composite TVAAS Index Score	2016-17 Weighted PPE	Quadrant Location
Average of MNPS Middle Schools	-1.86	1.45	N/A
Site #1	.1	1.41	Northeast
Site #2	0	1.30	Southeast
Site #3	-5.1	1.38	Northwest (City)
Site #4	-5.8	1.40	Northwest (County)

Exhibit 5: Return-On-Investment Analysis, High Schools

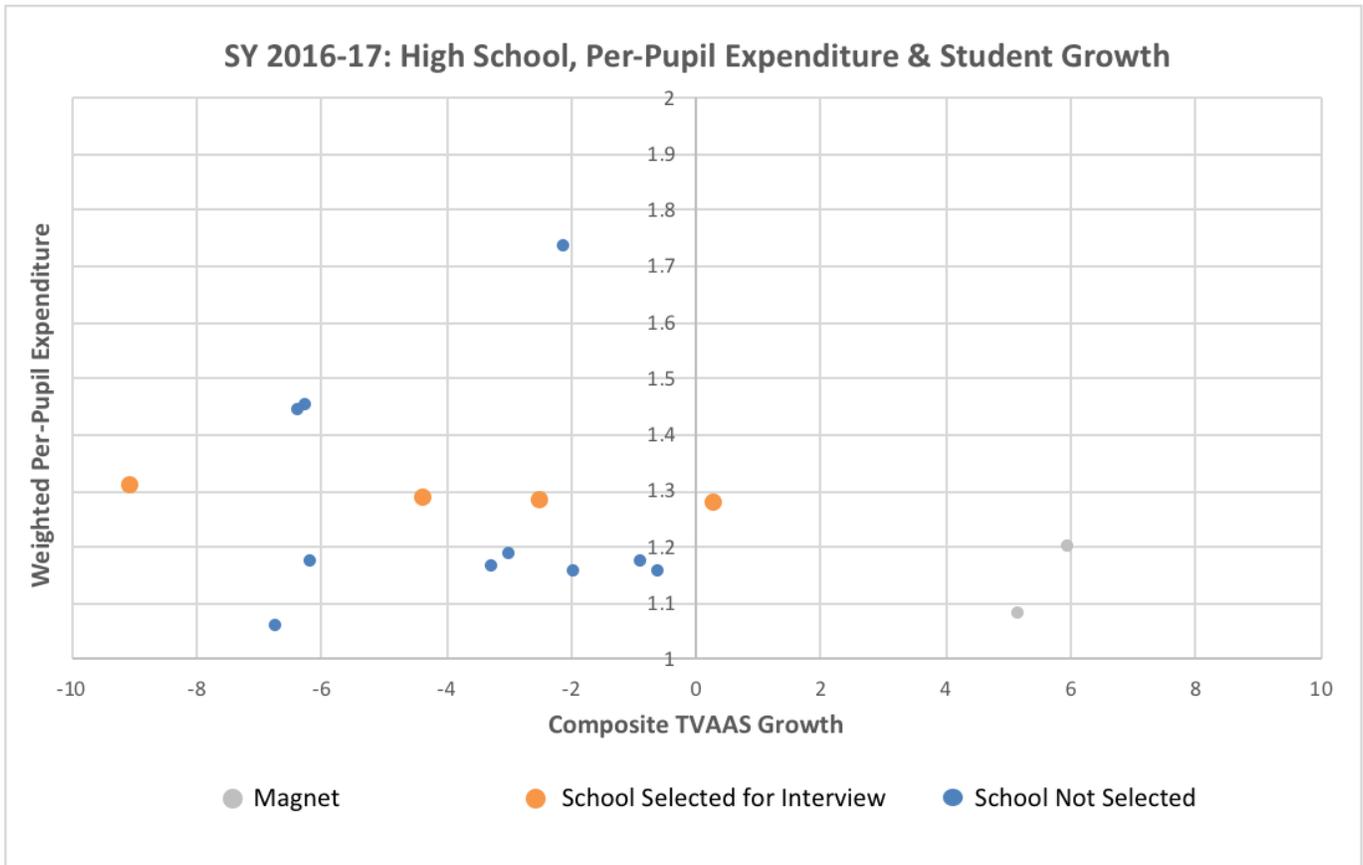
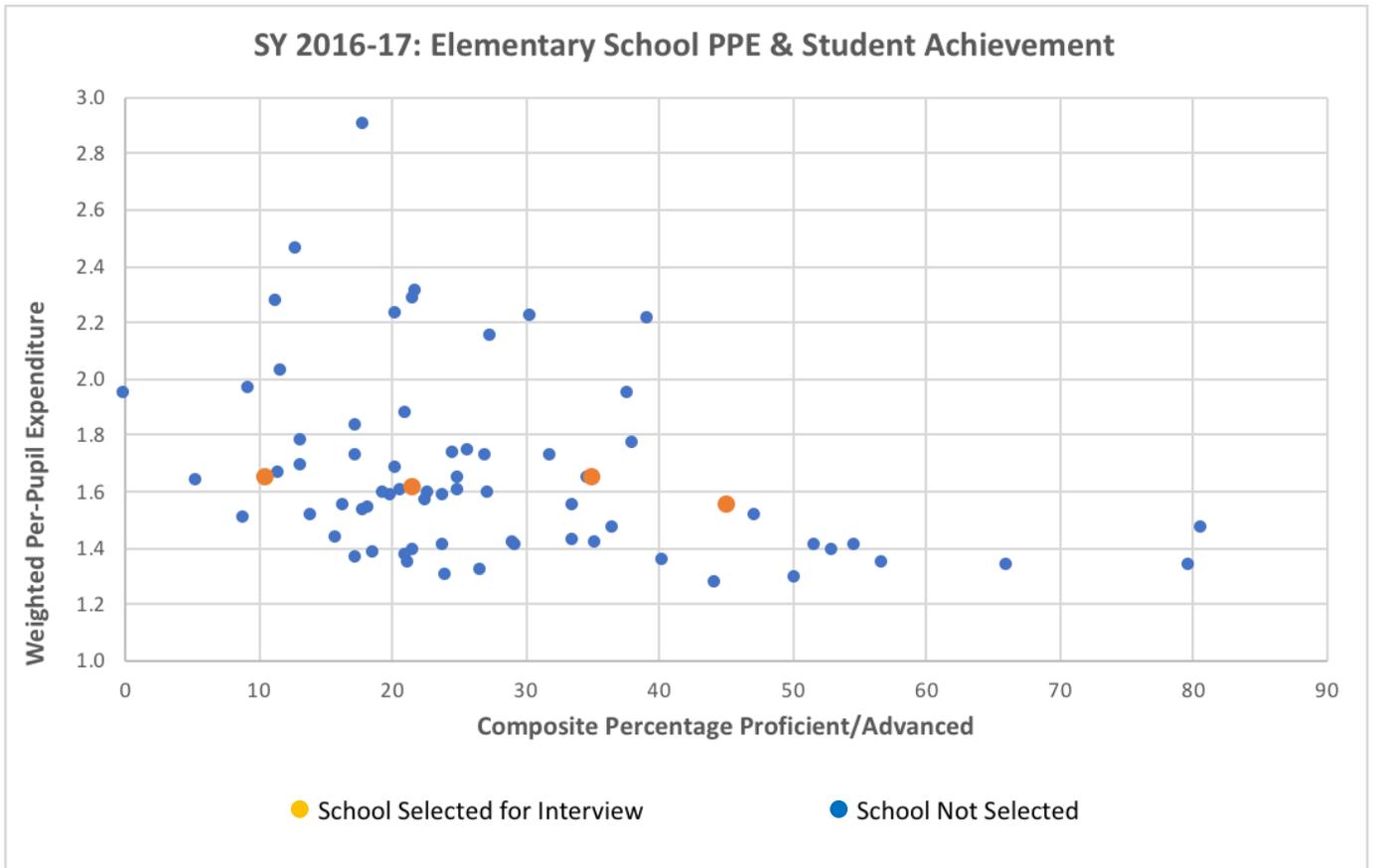


Table 12 summarizes relevant data for selected high school sites.

Table 12
High Schools: Case Study Sites

Case Study Site	Composite TVAAS Index Score	2016-17 Weighted PPE	Quadrant Location
Average of MNPS High Schools	-2.59	1.26	N/A
Site #1	.31	1.27	Northwest
Site #2	-2.47	1.27	Southwest
Site #3	-4.35	1.28	Southeast
Site #4	-9.02	1.3	Northeast

Exhibit 6: Return-On-Investment Analysis, Elementary Schools



Finally, Table 13 summarizes relevant data for selected elementary school sites.

Table 13
Elementary Schools: Case Study Sites

Cast Study Site	Composite Achievement: % Proficient/Advanced	2016-17 Weighted PPE	Quadrant Location
Average of MNPS Elementary Schools	27.79%	1.66	N/A
Site #1	45.15%	1.55	Northeast (County)
Site #2	35.2%	1.65	Northeast (City)
Site #3	21.6%	1.61	Southwest
Site #4	10.6%	1.64	Northwest

As a means of comparison to understand how schools, with similar budgets, allocate resources outside of the context of the SBB initiative, we also selected four charter management organizations (CMOs) to interview. To select these CMOs, we chose four sites that were among the highest performing charter management organizations in the district. We also selected sites that would have equal representation across grade-levels and across the MNPS quadrants.

Table 14
CMO: Case Study Sites

CMO Case Study Sites	Composite TVAAS Scale Score or % P/A		Type of Schools in Network	Location in MNPS Quadrants
MNPS Average	TVAAS MS	-1.86	N/A	N/A
	TVAAS HS	-2.59		
	% P/A, ELEM	27.79		
Site #1	TVAAS MS	8.0	Elementary, Middle, and High Schools	Northwest, Northeast
	TVAAS HS	5.7		
Site #2	TVAAS MS	9.4	Middle and High Schools	Southeast
	TVAAS HS	5.6		
Site #3	TVAAS MS	7.6	Elementary & Middle Schools	Northeast
	% P/A, ELEM	52.4		
Site #4	% P/A, ELEM	61.0	Elementary School	Northeast

Participation

Of the traditional public schools selected, 75% participated in the qualitative interviews, including all four elementary schools, three middle schools, and two high schools. Of the three schools that did not participate, two principals declined participation and one principal did not respond to our requests for an interview. All four charter management organizations participated in the interview process.

In addition to these school leaders, we also interviewed district staff who directly oversee principals and the budgeting and school-improvement process. This included three community superintendents who are responsible for supporting principals within three of the four MNPS quadrants, and another participant

from district leadership. We also conducted an interview with one school-improvement facilitator who works directly with principals to develop their school-improvement plans and budget. The background of each principal and district staff respondent are included in Appendix C.

Findings, Part I: School Comparisons

Our findings suggest that significant differences exist between the approach of school leaders with a more significant return-on-investment and those that are lower-performing. In particular, leaders with a stronger return-on-investment described a strategic and intentional approach to budgeting, one that engaged multiple staff and stakeholders from the school and community.

Budgeting for Staff, Not Strategy

Each year, all schools in Metro Nashville Public Schools complete a School Improvement Plan (SIP) that outlines their goals and priorities for the upcoming school-year. In all four of our district staff interviews, respondents described the SIP as a driver of decision-making at the school-level, and all four respondents stated that principals effectively use their school-improvement plans to make decisions about their budget and spending.

However, none of the lower-performing school leaders described their decision-making process in context of these goals or areas of priority. When describing their budgeting process, many principals emphasized the importance of using funds to allocate staff to previously staffed or newly-created positions. One principal described her budgeting process in this way:

I will start with my teachers, how many teachers I'm allotted. After that, then with whatever money is leftover [I request additional staff]. I've already requested additional money for a STEAM teacher which is not typically part of the school budget. I've also requested money for a restorative practice coach and also a dean of instruction. Once I get all of my people, the important people in place, then we'll start looking at instructional supplies. If there are any moneys leftover, then, of course, it will go towards student needs, making sure that they are having all the supplies they may need to be successful. Then, if I'm very lucky, and there's any money left-over, then I could reach out and ask teachers if there is anything else that they would want.

Another principal described a similar process, allocating funds toward teachers and staff (including administrative positions and librarians), and then using remaining dollars for additional positions such as tutors or translators.

One high school principal said that “one of the easiest ways to spend funds [is] on people,” and described hiring newly certified teachers in order to maximize his budget. He described a scenario in which he was hiring five new people for his staff:

Let's say we wanted to spend the bulk of our Title budget on people....If you can go find five people who are brand new with a bachelor's degree in step zero or step one on the scale, each person costs

on average \$10,000 less than the average position. Then you've just expanded your budget by \$50,000.

In each of these interviews, principals specifically named staffing as the driver of their budgeting and decision-making process. While many principals named their school's goals when asked questions specifically about the School Improvement Process, few referenced them when describing the budgeting process itself.

Overall, lower-performing principals did not describe resource allocation as a potential driver of student achievement of school improvement. One middle school principal framed the budgeting process by saying, "We'll talk about what we need, what we have to have, what we can't go without. Then [we talk about] things that we would love have that would make things a little smoother for us or increase student achievement."

One district staff member noted a potential reason for the disconnect between the development of the School Improvement Plan and the creation of the school's budget. She explained that principals often view school improvement plans "as compliance," "something that they wrote and checked-off, and they put it on the backburner, versus using that as a continuous process throughout the year."

Depth of Data

While lower-performing principals did not describe aligning their budget to areas of priority, almost all referenced using data as part of their decision-making process. Many principals described using end-of-course assessments, interim assessments, and school culture data (including attendance or the number of disciplinary referrals) while creating their budget.

Most of these leaders, though, had difficulty describing how the data directly informed specific decisions or choices in the budgeting process. Primarily, leaders connected this data to decisions related to hiring additional staff or purchasing a specific intervention material or software. One middle school principal said, "If the school improvement plan says that we need to work on literacy and numeracy and the school culture, then, of course, you look at those extra positions that we talked about."

Another principal described purchasing i-Ready software to increase student growth and achievement. She said, "One of the things in the SIP is to work with students to help them grow.... That happens in our RTI [Response to Intervention] and PLT [Personalized Learning Time] class. The students will work directly in that PLT class with i-Ready. That specific piece of software will lead to the growth that we've also mentioned in our SIP."

One principal also described challenges making data-informed decisions due to the impact those decisions may have on relationships that she has with staff members on her team. She said, "You got to know where you're going, you got to have your SIP, you got to use your data. But many times decisions are made based on relationships and not based on where you really need to go."

Planning for “Maximum Benefit”

In contrast to the accounts described above, the principals with stronger returns-on-investment described a significantly different approach to budgeting and school improvement. One middle school principal described an intentional approach to the budgeting process which included an analysis of the previous year’s investments and close collaboration with members of his leadership team.

When creating his school’s budget, this principal began by determining which strategies yielded “maximum benefit...from the investments made in the previous school-year.” If an investment did not lead to the anticipated outcomes, the principal worked with his leadership team to determine if the investment was insufficient or if the money was not utilized in the most effective way. Following this process, the leadership team worked together to develop set three targeted areas of improvement for the following year.

While this principal did use funds to create new positions on his school-team, he clearly articulated how these positions contributed to specific programmatic changes and improvement strategies:

We hired two deans that focused on climate and culture...So, the deans worked as classroom management coaches, as SEL [Social-Emotional Learning] implementers along with counselors. They developed morning meetings and advisory lessons around character education, around what it looks like to be a great student....That allowed the two assistant principals and the principal to focus on coaching, and instructional practice, instructional leadership in the classroom. We were frequently in classrooms, giving feedback, coaching teachers, doing formal observations as well. Which really gave us the best knowledge of what was happening on a daily basis throughout the school.

The principal also created two innovative roles that contributed to the school’s focus on instructional coaching and support for teachers. He hired two “multi-classroom leaders,” teachers who taught for half of the day and coached other faculty for half of the day. These teachers lead demonstration classrooms, frequently modeling best practices and co-teaching with the faculty that they supported.

When asked what actions had contributed most significantly to the school’s success, the principal described the importance of setting a clear vision for the school and effectively communicating that vision to staff and students:

That begins with establishing a culture of high expectations for everyone. That includes, at the beginning, just launching how we are going to operate as a school. Ensuring that everyone is bought into the vision of the school. Ensuring everyone understands the way we work and what our goals are.

Conversation and Differentiation

At an elementary school with a strong return-on-investment, the principal described a different, yet similarly intentional approach to budgeting and school improvement. This leader began the process by engaging every member of the school community:

I sat down with every single faculty member from the custodian to the teachers. I sat down with every single person and I said, "What's something you want to change?"....It was such a rich conversation. I got everything I needed to hear through those conversations.

Following this step, the principal collaborated closely with the school's guidance counselor to analyze student achievement data and determine the needs of individual students. For each economically disadvantaged student in the school, the principal and school leader tracked their achievement outcomes along with the supports that were being provided to the student, including counseling, tutoring, and parent engagement. The principal shared, "I'm a name person, not a number person. I want to know: it's Bob and James and Sylvia. I want to know their names so we can do something about it."

The principal used these data sources, the information gathered from his conversations with staff and knowledge of individual student needs, to make determinations about resource allocation and the budgeting process. Similar to the middle school principal described above, this principal also considered the impact of the previous year's investments, noting, "Before you start this year's budget, we have to look at, you put this money aside for this – was it worth it or was that beneficial? Would you do it again?"

While this leader did not describe the specific strategies and priorities that his team identified, he did reference the importance of revisiting the school's priorities throughout the year. He said, "We have a poster in our conference room [that says] these are our priorities. This is what we're looking at. We're always thinking, 'How are we going to address the achievement gap?' There's an accountability system of, 'Is this really working for kids?'"

Training Gap

Differences between the higher and lower-performing principals were also evident when they described their training on budgeting. Overall, principals with a stronger return-on-investment were well-informed of the available resources and described the importance of support from district staff. One leader described the process at the district level, saying, "There's a principals' training that comes every year with the school budget. There are help sessions that come as well. You can attend as many of those as you like. There's ongoing training, just informal training that I have with my planning facilitator who I meet with regularly. She helps with budgets and answers any questions that I have."

Another school leader noted the importance of his collaboration with his School Improvement Facilitator. "[My facilitator] is really good for me to bounce-off ideas like, 'Hey, I want to do this. I'm thinking about doing this. What is your input on this?'"

In contrast, many of the lower-performing principals reported a limited understanding of the resources available through the district and inadequate access to training. One leader reported attending a training "seven years ago," and another was not aware that budget trainings were available through the district. She said, "I can't describe [the training] because I haven't had any. Nothing I'm aware of. I think the district is just bringing us in to have a conversation about it, but there's not actual training."

One leader did note that she had attended a training, but described the experience as transactional in nature:

Each year you go to a session and they have the handbook. These are the required positions. These are what is allowed, what's not allowed. But as far as actually creating the budget based on need? There's not. I mean nobody sits down with me and says, "Let's look at your data." Or [says] which data to look at as we start making informed decisions.

District staff also described the need for additional training and support, noting that that the training currently provided by the district is focused on “how to understand the budget” and “logistical pieces.” One staff member noted the need to “go back to square one,” asking, “how do we hold a principal accountable for what they’re doing with the money when they’ve had no training how to be strategic about staffing?”

Findings, Part II: Equity, Flexibility, and Transparency

In our conversations with school principals and district staff, we also focused on the district’s three primary goals: to improve equity, expand flexibility, and increase transparency. Overall, our findings suggest that differing perceptions exist between district staff and school principals, across each of these three priorities. In addition, while most respondents believe that student-based budgeting has improved outcomes across all three goals, challenges persist within the model.

Limiting or Extending Principal Flexibility

Overall, school principals and district staff reported differing perspectives on the importance of principal flexibility and autonomy. All of the principals that were interviewed reported that the flexibility provided by the student-based budgeting initiative was imperative to their work as a school leader. Four of the principals reported that they needed increased flexibility in order to meet the needs of their students and school. A middle school principal explained, “I couldn’t imagine somebody else making those decisions for me, because they don’t know fully the needs of my school...They don’t know the details about the school, the students, and the community.”

A majority of the district staff, however, raised concerns about the flexibility afforded to principals through student-based budgeting. One staff member described this concern in context of the district’s academic performance, saying, “I don’t know that they need additional flexibility because we’ve had a high degree of principal autonomy. That hasn’t necessarily served us well over the past few years because even with that, we still haven’t met our academic outcomes.”

Another district staff member shared concerns regarding principals’ capacity to effectively create the budget, noting that school leaders often require “four or five meetings before they finally get an approved budget.”

Principals sense that the initial flexibility afforded through student-based budgeting may be more limited in the future. “You hear ‘flexible’ less than you did a couple of years ago,” a principal explained. “Sometimes, I wonder where we’ll be this year when the budget rolls out.”

“Adequate is Squishy”

Because the district’s goal of equity is closely tied to the concept of adequacy, we focused on both outcomes in our conversations with district staff and school leaders. Amongst district staff, there was disagreement regarding the adequacy of school allocations. One staff member said that the funding allocations were adequate if used in a “very strategic way,” while another raised concerns regarding adequate funding for differentiated instruction. She said that schools can “handle the Tier 1 instruction fine,” but that schools cannot provide the “depth” of intervention needed with current allocations.

Another district staff member raised questions about the concept of adequate funding, saying, “I like the word sufficient better because adequate is squishy. What’s the definition of adequacy?...Obviously we and they always want more and need more, but they able to run their schools, and they’re getting more resources now than they ever have.”

Principals, similarly had varied responses about the adequacy of current school allocations. Four principals reported that current funding allocations are adequate, while four disagreed. One principal said, “I don’t think many, if any of us, are getting enough to meet our goals,” while another principal said that the allocation was “really close,” “not a lot off of what I need.”

Small Schools and Special Programs

Both district staff and principals noted challenges associated with the equitable funding of schools within the student-based budgeting initiative. Overall, most respondents reported that SBB had increased equity within the district, but drew attention to the needs of small schools, schools with a smaller number of disadvantaged students, and schools with special programs.

For smaller schools, both district staff and principals noted challenges associated with staffing. A district staff member shared that one school in his quadrant had one staff member allocated to serve meals in the cafeteria and operate as the office manager, “manning the front desk.” A principal noted that “some positions should just be automatic,” regardless of school size, including a principal, assistant principal, and school counselor.

Principals, in particular, noted a need for resources directed towards schools that had special programs, such as a STEM-focused middle school or International Baccalaureate program at the high school level. In addition, principals who serve a more affluent student population expressed concerns regarding the adequacy of current allocations. One principal described the process as “infuriating,” and noted that he can no longer staff his school adequately.

School-Spending = Clear; District-Spending = Opaque

Overall, principals reported that student-based budgeting has successfully increased transparency with regard to school-level allocations. One principal noted that prior to SBB, school-level funding was “cryptic” because “you never knew what someone else got.” Now, principals report that “it’s clear that this is the amount of money you receive, and this is where it’s going.”

Despite these positive perceptions, questions arose from both district staff and principals with regard to the transparency around spending at the district-level. Principals described spending at the district office as “opaque,” and one principal was especially critical of district-spending and “waste.” When describing staffing at the district-level, he noted:

I see people and wonder "I don't know what your job is but I think I could do it in my spare time with one hand tied behind my back." I see departments that continue to hire more and more and more people and still aren't getting the job done. And when I think about I'm not getting the funds I need to have some critical positions here in my building to do my job, I wonder sometimes "Is there enough scrutiny of the level above me on where that money is?"

These concerns were reiterated by a district staff member who raised concerns about the proportion of funds allocated to the district:

The thing that kind of scares me a little bit...was the first time I looked on that page and it showed here's what we earn per student, here's what goes to the school, here's what central office keeps. Central Office keeps almost half of what goes to the school. That, to me, I would have a hard time putting that out in front of a parent.

Findings, Part III: Alternative Models

In an effort to understand alternative school models and their value to MNPS’s student-based budgeting efforts, we interviewed four high-performing local public charter school leaders using a modified principal interview protocol. Responses were most robust in leaders’ descriptions of budgeting processes and principal flexibility and autonomy. Equity, adequacy, and transparency had more limited results. However, given that MNPS has a public charter sector with notable student achievement outcomes, it is useful to understand how public charter schools address these areas of interest as a means of comparison to the SBB model.

Budget Staff Specialization

Unlike their traditional public-school counterparts, charter network leaders reported that specialized staff members were essential to budgeting and operations activities. In most cases, charter leaders were assisted by a dedicated staff member, or, in one case, a board member (with a background in finance) filled this specialized role. In some cases, this staff member was almost exclusively focused on school finance, which left school leaders and principals the opportunity to focus on instructional quality and school culture. Respondents indicated that the budget/operations staff member typically had training in finance or a

related field, and/or worked in either the public or private sector prior to being employed by the charter school. Respondents also emphasized the importance of this role in relation to the principal's role as instructional leader. One CMO leader who oversees multiple campuses, commented:

Where we are now is we give principals guidelines, and we really give them to the Director of Operations for the team. The Director of Operations' job is to listen to the principal's vision, and for the areas where they have discretion, makes the discretionary recommendations....The principal should then say yea or nay, or Q&A. Then those then get presented back to us.

The role of this operations expert in the budget process was similar across the charter schools in our sample, and in some cases, evolved along with the growth of the school. The importance of this dedicated role, however, persisted.

One charter school network, that recently expanded from one to two schools, discussed the importance of staff engagement between budget specialists and the core school leadership and instructional staff. This respondent, who works primarily to oversee the school's finances and operations, commented:

I'm not a schools guy. I leave that to the school leadership teams...Last year we expanded the conversation [about our budget] from just the School Directors, to the school leadership teams, which would include the Academic Deans [and] the Deans of Students...We want them to provide us feedback, to justify, or to explain how or whether or not, those investments are reaping the desired benefits.

Overall, charter leaders emphasized the importance of dedicated operations staff working on the budget in collaboration with key instructional personnel. Common to most of the charter school sample was that budget staff had deep finance knowledge and tended to have professional experience outside the education field. In contrast, the traditional public school principals and district staff noted that budget support to schools was conducted by School Improvement Facilitators within each of the four district quadrants. District staff noted that each quadrant had specialized staff responsible for helping schools plan budgets and use their School Improvement Plans (SIP) accordingly. However, most principals we interviewed noted the SIP did not have significant bearing on their annual budget planning or decisions making. Moreover, these principals also reported that School Improvement Facilitators were marginally helpful in the budget planning process (see Findings Part I, Budgeting for Staff, not Strategy). One final point of contrast between charter and district leaders centered on budget training. Other than the initial SBB training provided by MNPS vendor ERS, district respondents did not describe any other specialized budget training for either School Improvement Facilitators or Principals. Principals did report that there were annual 'drop-in' sessions for budget planning.

Principal Flexibility and High-Impact Decisions

Related to the theme of specialization, charter-school respondents also emphasized the role of principals as instructional leaders. In context of the budgeting process, multiple respondents noted that school leaders

and principals should focus on a limited subset of decisions which are closely linked to student outcomes. This differed from traditional public principal respondents where only a small subset reported budget decisions being made based on school level strategy to address student outcomes (e.g. achievement data). Charter respondents suggested that flexibility and autonomy are important for school leaders and principals but only within a narrowly defined scope of budgetary decisions. A network-level leader explained his organization's approach:

"What we've learned is that...there are decisions that are high-leverage, and there are decisions that are not high-leverage. We don't want to give principals low-leverage decisions that are time-consuming that don't really drive student results. The main event, if you will, for a principal is recruiting, training, retaining amazing teachers, coupled with building an amazing culture for kids and families. That's where all of their efforts should be in."

One respondent who serves as the Executive Director of his school's network reiterated this idea, stating, "Right now, the role of the principal is more they're the main instructional leader of that grade level and develop our staff, but I take care of all the finance and operations stuff."

Another leader suggested that flexibility and autonomy was primarily important in context of the complete autonomy granted to their school as a charter management organization. He commented:

"My one thought would be that student-based budgeting doesn't work...unless there's autonomy in other places too. [It] works for us because we also have autonomy over our salary scale. We have autonomy over our staffing models. We have autonomy over our curriculum."

Charter network-leaders also noted that they were open to granting increased autonomy to principals and building leaders if there was a gradual release, based on merit or skill. One network leader explained:

"What qualifies you to have a certain level of autonomy?...One of the big dangers of the work is decision fatigue, in just putting too many decisions in front of people, and they just get exhausted by decisions. I think autonomy is really important, and I think earned autonomy and really thoughtful and intentional autonomy is even better."

Another respondent echoed this sentiment, but admitted that principal autonomy and flexibility at their network is still emerging. This leader emphasized the role of the school principal as the instructional leader, noting:

"I just had a conversation. One of our principals is like, 'Can I see what the salaries are?' It's always been just like a lock box with me, an HR person that does payroll. I was like, 'I've never thought about that,' but I guess as a principal, you probably do want to know what your staff is making. Those kind of conversations are just starting. It's probably safe to say that at this point, flexibility and autonomy is not something that the principals are experiencing."

This leader demonstrated openness to granting additional flexibility and autonomy to principals, but was also hesitant due to school leaders' inexperience. Taken together, charter leaders showed willingness to

grant greater autonomy to principals if the range of decisions was narrowly defined and based on the experience of the principal. By contrast, district staff reported differential comfort with principal autonomy and flexibility, noting that some principals needed support and development. District principals also reported additional flexibility in decision making but not necessarily in high impact areas (e.g. hiring, curriculum, and professional development). See Findings Part I, Training Gap for greater detail.

Fund the “Important Stuff”

During the budget planning process, charter leaders noted that they pay diligent attention to allocating funds based on their perceived impact on student achievement. This was not typical of district principal interviews with the exception of two respondents. Most charter leaders articulated a key set of critical factors believed to be highly related to student outcomes and described allocating resources strategically to these areas of focus. When describing his budgeting process, one charter leader explained:

The philosophy is knowing what's most important... What were the main drivers in getting the student achievement where it needs to be?...The three things that are the biggest inputs for student achievement are personnel; curriculum materials (whatever is needed there), and professional development. Those three things take priority over everything else.

Another leader described a similar approach based on setting defined areas of priority. He explained, “We collaborate as a leadership team to essentially identify two to three key problems that we want to solve next year.” Once these areas of priority have been identified, the team aligns their staffing model and resources to these goals.

Charter leaders also consistently reported that funding decisions were consistently linked back to their desired impact on students. Almost all of the leaders in our sample noted that a lack of impact would result in resources to being deployed elsewhere. One network-level leader explained, “We want [principals] to provide us feedback, to justify, or to explain how or whether or not, those investments are reaping the desired benefits. If not, we cut them, and you can reallocate that somewhere else.”

Student Outcomes as Adequacy

Overall, responses to questions about equity and adequacy were somewhat limited from the charter school leaders in our sample. One leader noted that their current level of funding was adequate given that students were on track to achieve their goals:

“Right now, we have high school seniors.... 62% of them hit a 21 or higher on the ACT last year. They have an average of 22.1 on the ACT. Our expected college completion for that cohort is going to be 55% or higher, so we're hitting our goals.”

This same leader, however, went on to describe some targets that were not achieved, but did not attribute these shortcomings to lack of adequate or equitable funding. Instead, the leader emphasized the upward

trend of improvement. He commented, “We're not hitting goals everywhere at every grade level, at every subject...but as a whole, year over year, our schools have gotten better on almost across every indicator.”

Another leader echoed this framing, while drawing a distinction between equity and adequacy. He explained, “My perspective is, equitable? No. Adequate? Yes, because of our outcomes.”

Limited Transparency

Overall, the charter leaders in our sample expressed an array of sentiments about school funding transparency, with few areas of commonality. One area of consistency was that school budgeting seems to be similarly opaque in both the public charter and traditional public sectors. One leader commented:

I think [in terms of] transparency, I don't know how much the district spends on different schools. I don't know how much it costs to operate MLK versus Kirkpatrick...I actually don't think charter schools do a particularly good job of being transparent about how they spend all their private dollars either. I don't know how much [other charter networks] spend to operate a school.

DISCUSSION

Overall, both our quantitative and qualitative analysis of MNPS’s student-based budgeting initiative yielded interesting findings. When considered in context of the concepts associated with equity, adequacy, and principal empowerment, much can be learned from the district’s approach to student-based budgeting.

Equity and Adequacy

Accurately determining student need and adequately weighting school allocations remains one of the most significant challenges in school finance reform. Our quantitative analysis suggests that the district has developed a model that has increased equity for schools serving higher proportions of economically disadvantaged students.

However, as Baker and Green (2008) note, within the context of a vertical equity approach such as this one, the allocation of greater resources should be adequate for all students to achieve equal educational outcomes. Our return-on-investment analysis reveals that within Metro Nashville Public Schools, schools with similarly assessed needs and allocations currently achieve significantly disparate outcomes. For example, the lowest-performing middle school in our case study sample, with an average per-pupil allocation of 1.4, earned a composite TVAAS growth score of -5.8, while the highest-performing middle school in our case study earned a growth score of .1, with an almost identical allocation. Additionally, none of the schools in our sample achieved student outcomes commiserate with those of the highest-performing magnet and charter schools within the district.

As a result, it is evident that the district has either not adequately funded some schools to achieve desired outcomes, or as the literature suggests, these outcomes are the result of a “complex integrated puzzle” which are also driven by factors such as school leader capacity and efficacy (Ladd, 2008).

Principal Empowerment and the Budgeting Process

A critical assumption of MNPS’s student-based budgeting model is that principals are best-equipped to make decisions about resource allocation. In this model, principals must have the skills and knowledge to effectively understand the challenges in their schools and properly allocate resources to address them.

However, as our interviews with district staff and school leaders suggest, some principals in the district are better equipped to strategically deploy resources within their schools and strategically align resources to meet the needs of their students. As Plank and Smith (2008) describe, increasing principal flexibility and autonomy will often fail to drive student outcomes in the absence of “intensive external supports” and an intentional increase of local knowledge and capacity at the school-level. While some of the principals in our case studies seemed able to effectively allocate resources through the budgeting process, others, across grade-level and school-type, were in need of additional support and capacity.

Budgeting Process

The process of creating the budget on an annual basis was a significant focus of our conversations with district staff, school principals, and leaders of charter management organizations. When used strategically, the budgeting process itself can focus school leaders on key educational priorities, improving the school’s productivity (Guthrie et al, 2007). An ineffective process, however, can similarly create a “drain” on school leaders, and take time away from the core tasks of instructional leadership.

Multiple respondents in our study described the budgeting process as a compliance-focused activity, often focusing on staffing as the primary driver of the budget and few referencing their school’s goals in context of the budgeting process. These interviews stood in contrast to the conversations with leaders of charter management organizations who described a more targeted approach to budgeting at the individual school-level.

While individual principals within CMOs often had less ownership over their school’s budget as a whole, almost all of the CMOs in our study involved school leaders in a narrower-set of high-leverage decisions. In addition, almost all of the CMO leaders in our study described the budgeting process as a truly continuous process of monitoring and implementation, serving in many ways as the “practical bridge between planning and implementation” (Guthrie et al., 2007).

RECOMMENDATIONS

Our conversations with district staff and school principals revealed much about the design and implementation of the SBB initiative as the district pursues an equity-driven, flexible, and transparent budgeting model. In addition, our quantitative analysis revealed that while adjustments in the funding formula have created greater equity for some schools, additional allocations and adjustments may be helpful to meet the needs of certain student populations. Based on this analysis, we present our recommendations and considerations for Metro Nashville Public Schools.

Adjust SBB Weights and School Allocations

Adjust the student-funding formula to account for the needs of schools serving English language learners, small schools, and schools with special programs.

Any district employing a weighted funding formula must consider if funds are distributed adequately and equitably across schools in the district. Our quantitative analysis demonstrated that MNPS has increased equity for schools serving a higher proportion of economically disadvantaged students over the last three years. In 2014-15, for example, a school whose student population is 75% economically disadvantaged would have received, on average, \$6,593 per student. In 2016-17, this allocation increased to \$7,619.

Despite this change, our return-on-investment analysis demonstrates that many schools receive similar allocations but achieve vastly different student outcomes. While our qualitative analysis reveals some potential factors contributing to this difference in achievement, further inquiry is needed in order to more thoroughly understand this variation in performance. In addition, the district should consider providing additional resources to the lowest-performing schools or for schools with high concentrations of disadvantaged students.

In addition, over the last two years, the district has increased the weight for English Language Learners. Given this increase, schools that serve a higher proportion of EL students still receive, on average, a smaller per-pupil allocation. If the district believes that a high concentration of EL students represents a significant additional need, MNPS should consider adding an additional weight or adjustment for these school sites.

Finally, both district and staff interviews revealed concerns regarding allocations for small schools and schools with special programs (such as STEM-focused middle schools and International Baccalaureate programs at the high-school level). Based on this considerable feedback, we recommend adjusting the funding formula to provide additional resources to small schools (to support adequate staffing), and to schools with specific programmatic initiatives that were initiated at the district-level.

Principal Training & Support

Develop a more robust training and support model for principals focused on school improvement strategies and goals.

Currently the district provides supports that align targeted school improvement priorities to the annual budgeting process. Consistent principal feedback reinforced that the School Improvement Plan (SIP) is, at times, seen as a compliance exercise with limited value to the budgeting process and day-to-day school improvement efforts. Most principals reported that they started their budget process by allocating resources toward current staffing models (e.g. teacher allotment), administrative needs and curricular materials, and other standard school expenditures. Some principals indicated that after such priorities were accounted for, they addressed areas of need with ‘whatever money is left over’. The SIP was rarely reported as a guiding document in actual budget-planning activities

As a result, we recommend for MNPS to focus efforts on training and support for principals in order to re-orient their budgeting process towards effective planning for school improvement. This training could potentially focus on identifying specific areas of focus or priority, developing a theory-of-change to address the identified challenges, and monitoring implementation and effectiveness.

In our conversations with principals and district staff, multiple respondents in our sample noted the value of the Educational Resource Strategy (ERS) training that was initially provided to principals in the SBB pilot. Specifically, ERS supported MNPS to design their SBB formula and provided extensive training to school principals in the initial SBB cohort. One respondent specifically noted that the ERS training allowed leaders to understand how school-level improvement goals could be linked to budgeting strategies and planning. Another recalled that the training promoted a ‘different way of thinking’ about the budgeting process and school improvement. Given the existing familiarity with the ERS tools, and the fact that MNPS has a prior relationship with the organization, additional principal and administrative support from ERS is one viable option for increasing the effectiveness for training and support of school leaders.

Transparency for All Spending

Address transparency of district spending to match current expectations for school spending.

MNPS should develop an accountability mechanism to provide transparency for central office spending which mirrors the expectations for individual schools. Principals and district staff saw this as an issue of fairness and uniformly reported that the intent of SBB was to increase transparency at all levels.

One district official described fear at the prospect of publicly sharing the proportion of funding that goes to schools, noting that nearly half of the district’s allocation is spent at the central office. Principal respondents were more direct about this perceived inequity. In describing consistent growth in new positions in the central office, one principal noted that the return-on-investment model that was required at the individual school-level was not replicated at the district-level.

This recommendation may be fundamental to both principal morale and ensuring the effective allocation of resources across the district. Our findings suggest that most principals accept budget transparency as part of their role and are willing to adjust their decision-making processes in order to meet these expectations. However, there appears to be growing sentiment among most respondents that transparency and accountability are a significant areas of improvement for spending at the central office.

Strategic Focus on High-Impact Decisions

Focus principal’s involvement in budgeting on high-impact decisions.

Following the model described by high-performing charter leaders, MNPS should also explore strategies that focus principals’ involvement in budgeting process on high-impact decisions. In this case, *impact* is defined as having a direct and meaningful influence on student achievement.

Interview data from charter school leaders demonstrated an approach to budgeting that was focused and targeted. Principals were primarily engaged in decisions that impacted teacher recruitment and retention, the development of a strong school culture, and ongoing professional development for staff. This meant that other budgeting decisions were distributed to staff who primarily focus on school finance or operations.

This recommendation operates in contrast to the idea of maximum autonomy for MNPS principals. It is plausible that giving district principals a narrower scope of high-impact budget decisions (coupled with training and support) could be more successful at driving school improvement and student outcomes. In order to accomplish this objective, the district would need to couple this process with a revised school improvement plan. It was evident from our district principal conversations that budget planning and decision-making often failed to be driven by schools' SIP. As a result, this recommendation would be most successfully coupled with a revised training and support plan and revised approach to school improvement.

Appendix A. MNPS Student-Based Budgeting Weights; SY 2015-16 through SY 2017-18

SY 2015-16

Weights	ES	MS	HS
Grade Weight	.10	.05	
Prior Academic Performance (Poverty as a proxy in ES)	.10	.10	.05
ELL	.10		
SPED	Varies by Option Type (Range from 0.5 to 8.1)		
Base Weight (1.0)	\$4,247		

SY 2016-17

Weights	ES	MS	HS	Total Allocation
Base Weight (1.0)*	\$4,347			\$317.6M
Grade Weight	.10	.05		\$18.6M
Prior Academic Performance (Poverty as a proxy in ES)	.10	.10	.05	\$18.4M
English Learners	.21			\$12.0M
Special Education	Varies by Option Type (Range from 0.5 to 7.24)			\$42.8M
Hold Harmless				\$10.9M
				\$420.8M

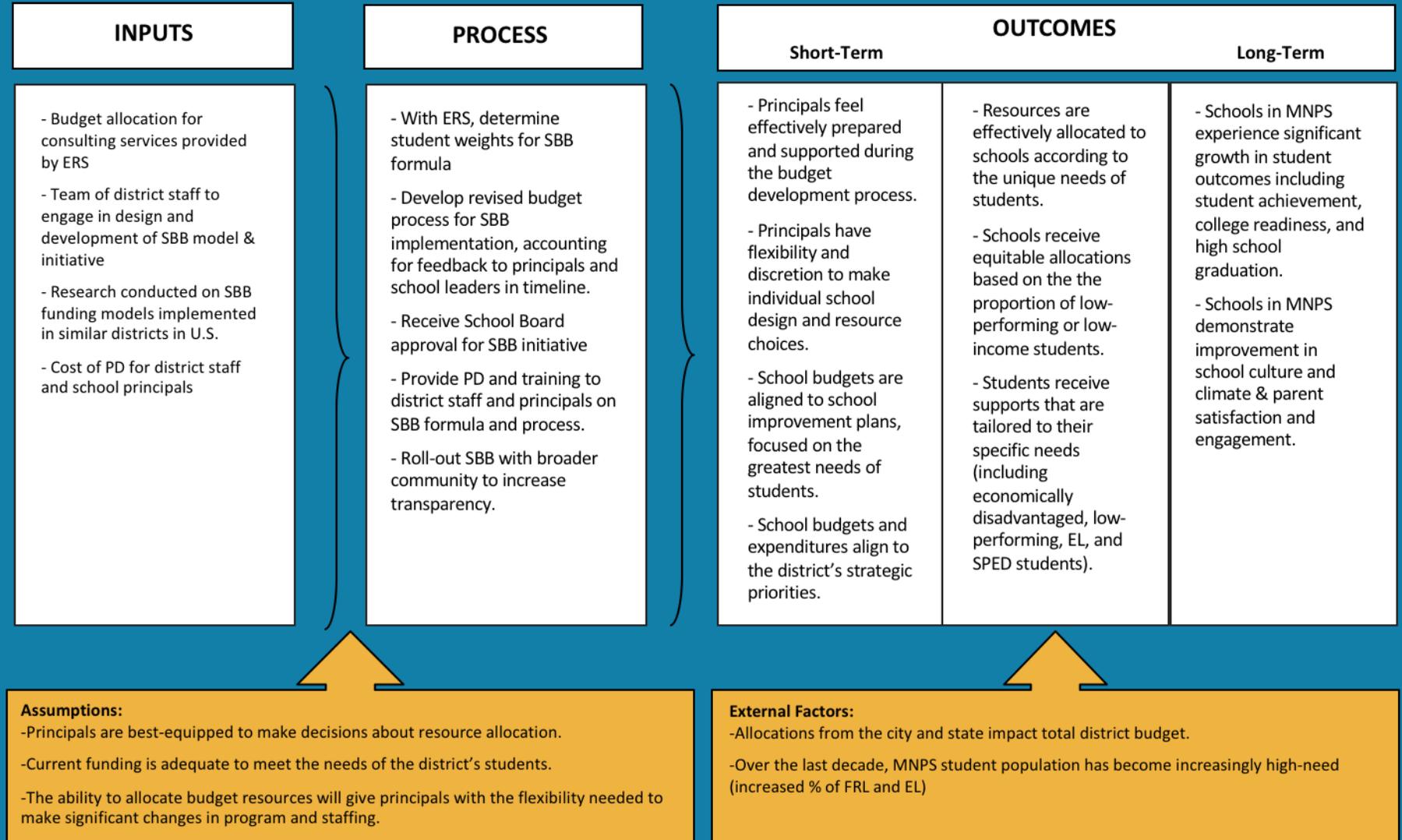
SY 2017-18

Weights	ES	MS	HS	Total Allocation
Base Weight (1.0)*	\$4,425			\$317.8M
Grade Weight	.10	.05		\$18.1M
Prior Academic Performance (Poverty as a proxy in ES)	.10	.10	.05	\$14.7M
English Learners	.21			\$12.6M
Poverty	.05			\$7.2M
Special Education	Varies by Option Type (Range from 0.5 to 7.24)			\$40.0M
Adjustments	Small Schools/Hold-Harmless			\$16.0M
				\$426.4M

Appendix B. Logic Model

MNPS, Student-Based Budgeting: Logic Model

By implementing a student-based budgeting model, MNPS will achieve three primary goals: improve equity (funding schools based upon student need), expand flexibility (increasing autonomy for principals to allocate resources at the school-level), and increase transparency (with regard to budget allocations and decision-making).



Appendix C. Qualitative Interviews, Candidate Background Characteristics and Responses

Principal Interviews

Interview	Grade-Level	Years as Principal	Years Working in District
Interview #1	High School	10 total; 3 at current school	18
Interview #2	Middle School	1	18
Interview #3	Elementary School	1	15
Interview #4	Elementary Schools	2 total; 1 at current school	4
Interview #5	Middle School	4	13
Interview #6	Elementary School	2	13
Interview #7	Elementary School	12 total; 3 at current school	32
Interview #8	High School	7	15

	Do you feel equipped to budget?	Has SBB increased equity?	Does funding allow you to meet goals?	Do you have needed flexibility?	Has SBB increased transparency?	Do you use the SIP in budgeting?
Interview #1	Y	Y & N	N	Y & N	Y	Y
Interview #2	Y	Y & N	Y	Y	Y	Y
Interview #3	N	Y & N	Y	Y	Y	Y
Interview #4	Y	N	Y & N	Y & N	Y	Y
Interview #5	Y	N	Y	Y	Y	Y
Interview #6	Y	Y	Y&N	N	Y&N	Y
Interview #7	Y	N	N	N	N	Y
Interview #8	Y	Y	Y	Y	Y	Y

District Staff Interviews

Interview	Years in District	Work Prior to Current Role
Interview #1	22	Principal and School Supervisor
Interview #2	21	Principal and Community Superintendent
Interview #3	11	HS counselor and Transformation Facilitator
Interview #4	16	Work in private sector, finance director for two additional school district
Interview #5	20	Teacher, Assistant Principal, Principal

	Has SBB increased equity?	Does SBB direct resources to schools that need them most?	Does SBB expand flexibility?	Do schools effectively use the SIP?	Has SBB increased transparency?
Interview #1	N	N	Flexibility not needed	Y	Y
Interview #2	Y	Y	Y	Y	Y
Interview #3	N	Y	Y	N	N
Interview #4	Y	Y	Y	Y&N	Y
Interview #5	N	Y	N	Y&N	N

Charter School Interviews

	Grade-Levels of Schools	Position	Years in Role	Work Prior to Current Role
Interview #1	Elementary	Founder and Head of School	6	Teacher and Instructional Coach
Interview #2	Elementary, Middle, & High School	Executive Director	13	Teacher and Principal
Interview #3	Elementary & Middle	School Director	7	Teacher and Principal
Interview #4	Middle & High	Director of Finance and Operations	6	Roles in city government and private sector

	Does funding allow you to meet goals?	Do you receive equitable funding?	Do principals have flexibility or autonomy?
Interview #1	Y	Unsure	N
Interview #2	Y	Y	Y
Interview #3	Y	Y	N
Interview #4	Y	N	Y

References

- Baker, B., & Green, P. (2008). Conceptions of equity and adequacy in school finance. In H.F. Ladd & E.B. Fiske (Eds.), *Handbook of research in education finance and policy* (203-221). New York, NY: Routledge.
- Chambers, J., Shambaugh, L., Levin, J., Muraki, M., & Poland, L. (2008). *A tale of two districts: A comparative study of student-based funding and school-based decision making in San Francisco and Oakland Unified School Districts*. American Institutes for Research.
- Foley, E., Miles, K. H., & Roza, M. (2010). Equity and student based budgeting. *Voices in Urban Education*, 29, 6-16.
- Guthrie, J. W., Springer, M. G., Rolle, R. A., & Houck, E. A. (2007). Modern education finance and policy.
- Gludemans, P. (2010). Allocating funds based on student and school needs. *Voices in Urban Education*, 29, 2-5.
- Ladd, H. F. (2008). Reflections on equity, adequacy, and weighted student funding. *Education funding. Education, Finance, and Policy*, 3(4), 402-423.
- Metro Nashville Public Schools (2016). *Presentation to Chamber Education Committee* [PowerPoint slides].
- Metro Nashville Public Schools (2016). *Metro schools begins budget analysis to ensure funding is matched to strategic priorities*. Retrieved from <http://www.mnps.org/blog/2016/10/4/metro-schools-begins-budget-analysis-to-ensure-funding-is-matched-to-strategic-priorities>
- Metro Nashville Public Schools (2017). *Request for assistance: Student-based budgeting*.

Rossi, P. H., Lipsey, M. W., & Freeman, H. E. (2004). *Evaluation: A systematic approach*.

Thousand Oaks, CA: Sage Publications.

Tennessee Department of Education (2017). *State report card*. Retrieved from

<https://www.tn.gov/education/topic/report-card>