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# *Best Practices in School Budgeting*

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## *3A – Applying Cost Analysis to the Budget Process*

### Pay for Priorities Phase

#### SUMMARY

##### **Prerequisite Best Practices:**

- None

##### **Key Points**

- Data on the current cost and staffing are an essential input to the budget process. These data help a district identify underinvestment in high-priority courses, provide a starting point for identifying trade-offs between different uses of resources, and may spur an investigation into new ways of providing a service.
- A staffing analysis shows how personnel are allocated to specific types of services within a school. In doing this analysis, a district should show the actual full-time equivalent positions for each school site and by each programmatic element (budgetary input associated with a service provided) at the school site. The district should also use actual compensation figures and include all personnel who work at the school site regardless of funding source or who they report to.
- A cost of service analysis identifies the cost of providing a service by highlighting key cost drivers. There are a variety of analytical methods to determine cost of service. One is to use fully loaded cost where employee salaries and benefits are included in the calculation. Another method is to use per unit cost, such as costs per student served. Another is to use cost effectiveness measures to measure the benefit the district receives for the money it spends.

##### **Related Award Program Criteria**

- Criterion 3.A.1: Cost Structure Analysis. The Applicant submits an analysis of its cost structure as a Supplementary Material. In the Award Application the Applicant explains why it chose the particular analytical techniques (e.g., staffing analysis, unit cost analysis - see the Best Practice for details) it has employed and what insights it gained.
- Criterion 3.A.2: Cost-Effectiveness Measurement. The Applicant should demonstrate the use of cost-effectiveness measurement techniques (see the Best Practice for details) and/or explain in the Award Application how it is building its capacity to more easily calculate cost-effectiveness measures.

### **Introduction**

Data on the current cost and staffing for existing instructional strategy are an essential input to the budget process. Data on a school district's current cost and staffing structure help a district identify underinvestment in high-priority courses (i.e., core courses, remedial courses), provide a starting point for identifying trade-offs between different uses of resources (e.g., larger class sizes for more instructional coaches), and may spur an investigation into new ways of providing a service.

Personnel are the largest cost for school districts. Hence, an analysis of a district's cost structure must start with understanding staffing patterns and allocations. Districts should also analyze their cost structure more generally. District budgets are usually constructed at the level of broad objects of expenditure, such as salaries, benefits, contractual services, equipment and supplies, etc. However,

substantial insight into a district’s expenditures can be gained by reporting costs in a way that supplies information into the true cost of providing a service.

Accordingly, this Best Practice document describes:

- I. Considerations in analyzing staffing for each school site.
- II. Considerations and methods for a cost-of-service analysis, including:
  - a) Fully loaded costs
  - b) Per unit costs
  - c) Cost effectiveness measurements

Examples of how these methods could be applied in practice are included in the appendices. Appendix 1 provides examples of how to conduct a staffing analysis, Appendix 2 discusses per unit cost analysis, Appendix 3 describes relative cost per outcome, and Appendix 4 details academic return on investment (A-ROI).

## I. Staffing Analysis

**Background.** An analysis of staffing should show the actual full-time equivalent (FTE) positions for each school site, including the associated cost of compensation for each position. Critically, the analysis should also show how personnel are allocated to specific types of services within the school. Ideally, personnel would be grouped by programs, which are defined as a set of activities with a common goal.<sup>1</sup> However, the GFOA recognizes that state-mandated charts of accounts and reporting requirements might render development of a full “program” structure quite impractical for a school district. A more realistic alternative may be “programmatic elements.” A programmatic element is a categorization of direct budgetary inputs (e.g., personnel, dollars) that can be clearly associated with a service provided by the school.<sup>2</sup> Analyzing personnel by programmatic element provides insight into how personnel are being used, not just the number of personnel at each school site.

Below are examples of groupings of personnel into programmatic elements:

- Teachers of core subjects (e.g., English language arts, math, science, social studies).
- Specialty teachers (e.g., teachers of art, music, electives, vocational topics).
- Instructional facilitators/coaches.
- Tutors for struggling students or staff who provide extra help to struggling students within the regular school day (referred to as “Tier II” interventions under an “Response to Intervention (RTI)” model<sup>3</sup>), for extended day programming, and for summer school.
- Teachers for English Language Learner (ELL) students.
- Teachers for special education.
- Pupil support staff, including guidance counselors, nurses, social workers, etc.
- Other support and administrative personnel, such as principals, school office staff, central administration, operations and maintenance, transportation, etc.

**Recommendation.** When conducting a staffing analysis, the GFOA recommends that districts analyze staffing by programmatic elements for each school site. Further, the GFOA recommends that districts observe the following practices when conducting the analysis:

**Identify a clear analytical question to be answered.** A staffing analysis can take any one of a number of possible focuses, including but not limited to comparing levels of teacher experience/effectiveness between schools sites (to reveal inequities in resource allocation between school sites), examining long-

term trends in staffing (which might be of interest to rapidly growing or shrinking districts), or identifying the funding sources for each position (if a district is trying to obtain a better understanding of the complete and comprehensive set of resources available to each school site across all funding sources, not just general operating funds). Districts should, therefore, specify the question it wants to answer with a staffing analysis and then structure the analysis accordingly. A clear analytical question helps districts focus its data gathering and analysis activities.

**Use actual compensation.** Districts often use average salaries of staff when analyzing the total cost of staff at a school site. Under this method, first, the total salary cost of all staff positions in a given classification (e.g., licensed teachers, principals) district wide is divided by the number of staff in that position district wide to arrive at an average salary figure for that position. Next, this average salary figure is applied to all positions at a particular school site (or working within a particular programmatic element) in order to estimate the cost of the staff assigned to that school site (or programmatic element). However, the average teacher compensation and average teacher experience/ effectiveness within a particular school can vary widely across schools within the district, often reflecting the fact that there is a greater prevalence of more junior teachers in hard- to-staff schools.<sup>4</sup> Analyzing cost using actual teacher salaries unmask these inequities. Further, adding the cost of benefits (e.g., health care, pension, etc) to this analysis (which is a substantial portion of staff compensation) provides a fuller picture of staffing costs and distribution of staffing costs. Districts need to understand how differences in teacher compensation drive differences in spending across schools. With this information, districts can make better decisions about staff assignment and support, take steps to remedy differences in the distribution of teacher talent between schools, and/or provide additional funding and/or support to schools with a high number of junior teachers.<sup>5</sup>

**Develop policy on how to account for centralized personnel.** Staff that provides direct services to students (e.g., nurses, psychologists) should be included in the staffing count for each school (partial FTEs, if necessary), even if they aren't under the direct supervision of the school principal. This shows the complete portfolio of resources available to each school.

**Include all staff, not just those funded by the general fund operating budget.**<sup>6</sup> Although the general fund operating budget usually is the largest budget in a district, a substantial amount of the district staff is often funded by separate "sub-budgets," such as state programs triggered by student poverty counts, Title I, Individuals with Disabilities Education Act (IDEA), federal preschool program, food service funds, etc. Hence, an analysis of the total staffing at the district's disposal would be incomplete without including these staff in the school sites that they serve.

**Consider analyzing actual time teaching.** In some cases, raw staffing figures may not provide a completely accurate representation of the time teachers spend with students due to their assigned duties other than instruction. In this case, districts might consider analyzing actual time teaching where there is reason to believe that raw staffing figures may not tell the whole story.

See Appendix 1 of this Best Practice for an illustration of how a staffing analysis might be conducted at a hypothetical school site.

## II. Cost of Service Analysis

The objective of a cost of service analysis is to provide a more accurate portrayal of the cost of providing a service by highlighting key cost drivers. The analysis also may help the district to see how class sizes and course offerings, teacher compensation schemes and assignments, and the school schedule affect spending. All of this allows the district to make more informed decisions on resource use. This Best Practice covers three cost-of-service analytical methods: fully loaded cost of compensation, per-unit costs (e.g., costs per student served), and cost-effectiveness measurements.

### Fully Loaded Cost of Compensation

**Background.** Districts often only consider employee salaries when making resourcing decisions, neglecting benefit costs (e.g., employee health care, pensions, etc.), which are a substantial portion of employee cost. Adding benefit costs to an employee’s salary enables the district to make a more informed decision from among budgeting alternatives. For example, replacing fully licensed teachers with paraprofessionals is sometimes proposed in school districts as a way to stretch limited budget dollars.<sup>7</sup> When comparing only salaries, it may appear that moving towards paraprofessionals would yield a substantial increase in manpower – perhaps as much as three paraprofessionals to one teacher, if you assume a salary of \$60,000 for the teacher and \$20,000 per paraprofessional. However, if you include benefit cost of \$15,000 per position (assuming paraprofessionals receive similar benefits to teachers), the ratio becomes far less favorable because the total cost of a teacher is now \$75,000 versus \$35,000 for a paraprofessional – or only 2.1 paraprofessionals to 1 teacher.

Other direct costs (e.g., the cost of materials and equipment used by the teacher or other service) and indirect costs, such as overhead allocations (e.g., cost for the support services associated with a teacher or service, such as payroll/human resources staff, central administration), are sometimes considered as part of “fully loaded” total cost. However, other direct costs and indirect costs should only be used as part of a cost of service analysis to the extent that this additional information will provide greater analytical insight than the cost to produce the information.

**Recommendation.** The GFOA recommends that districts use fully loaded compensation costs to analyze costs, especially when comparing alternative uses of funds. Districts should also include other direct costs and overhead allocations in the fully loaded costs, where such information will provide significant additional insight relative to the analytical questions being asked.

### Per Unit Costs

**Background.** The budgets for routine business and operational services, as well as services that impact students directly, can be broken down into per unit costs (e.g., cost per student served).<sup>8</sup> In addition to the more general benefits of cost analysis described earlier in this Best Practice, there are two other specific potential uses of converting expenditures into per pupil, per teacher, or other per unit costs.<sup>9</sup>

- **Enhance communications.** Converting larger budget figures (perhaps expressed in millions or hundreds of thousands of dollars) into smaller per unit costs makes the numbers more meaningful to the audience.
- **Reveal differences in costs.** Per unit costs can reveal where the district is spending greater amounts to deliver one service versus another. For example, researchers at the Center on Reinventing Public Education calculated unit costs at one district and found that per-pupil staffing costs averaged \$512 per course for electives, but only \$328 for basic math classes.<sup>10</sup>

Per unit costing need not be complex; a simple approach for instructional services would be to divide proportionately each teacher’s (and any aide’s) salary and benefits among the courses taught and the number of participating students,<sup>11</sup> thus providing a per pupil expenditure. This approach does not represent a “full cost” because it excludes the cost of building, equipment, and support services. However, it does provide a basis for comparing the relative resource requirements of different services. This simple approach can be supplemented by adding other relevant aspects of an expenditure to the per-unit cost calculation, with technology and other equipment costs being of the most immediate relevance, in most cases.

Per-unit costs can also be developed for support services, where salary and non-salary costs of a support department are divided by the number of departmental outputs. For example, the cost per invoice processed can be calculated where the sum of the total actual salary cost of accounts payable staff plus the

total of the accounts payable department non-salary costs are divided by the total number of vendor invoices/payments.<sup>12</sup> However, while the per-unit costs for instructional services can be compared against other instructional services within the district to evaluate trade-offs (e.g., the cost per student of an elective versus a core course), internal comparisons for support services are often not so straightforward. Accordingly, districts should strongly consider performing trend analysis and benchmarking with other districts in order to better analyze the per-unit costs of support services.

Appendix 2 describes per unit costs in more detail.

**Recommendation.** The GFOA recommends that the district use per-unit costs as analytical tools only as needed to provide additional insight. The GFOA does not recommend that a district express the entire budget in per-unit costs.

### Cost Effectiveness Measurements

**Background.** The foregoing discussion of cost analysis does not address the benefits created by the money spent. Cost effectiveness measurements account for the benefits produced by spending. Three types of cost effectiveness measures that a district might consider are:

- **Cost per outcome.** This measure is defined as the district's total spending in pursuit of a given outcome (e.g., reading proficiency) divided by the number of proficient students. So, for example, a district might calculate the cost per reading proficiency point achieved. This measure provides insight into the overall efficiency of the district's spending and will likely be the easiest measure for a district to calculate of the three measures profiled here.
- **Relative cost per outcome.** This measure is defined as a school site's actual cost divided by the expected cost of the school site if all funding was allocated purely on per student basis. The quotient of this calculation is then plotted against the level of student performance achieved at that school site. The result is a matrix that compares school sites in the district on their relative cost and their relative achievement, such that a school could fall into one of four categories relative to other schools: high performing and high cost, low performing and low cost, high performing and low cost, and low performing and high cost. This methodology is explained in more detail in Appendix 3.
- **Academic return on investment (A-ROI).** This measure is defined as the cost of a given programmatic element divided by the student outcomes achieved as a result of the spending on the programmatic element. A-ROI is, likely, going to be the most challenging of the three measures to calculate for most districts, but will have the most use for guiding detailed budgetary decision making. A-ROI is described in more detail in Appendix 4.

**Recommendation.** The GFOA recommends that districts address cost-effectiveness in their cost analysis during the budget process. Cost-effectiveness information communicates that budgeting is about more than just costs and supports better decision making. However, cost-effectiveness measures are more difficult to calculate than measures that only address cost. Therefore, districts should balance the benefit available from such measures against the effort needed to calculate them, and should build capacity over time to more easily calculate cost-effectiveness measures in order to reduce this effort (thereby gradually making cost-effectiveness data a more readily available input into the budget process).

### Endnotes

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<sup>1</sup> Definition of a program from Robert Bland and Irene Rubin, *Budgeting: A Guide for Local Governments* (Washington, D.C.: ICMA, 1997).

<sup>2</sup> Note that a programmatic element is not intended to capture indirect costs.

<sup>3</sup> RTI is an educational framework that emphasizes regular monitoring of student progress, reliance on rigorously tested and proven instructional methods, and use of data to make decisions on educational strategies. RTI identifies different “Tiers” of instruction. Note that response to intervention is also sometimes abbreviated RtI. GFOA’s Best Practices do not differentiate between RTI and RtI though the two abbreviations are sometimes used to refer to two different approaches to response to intervention.

<sup>4</sup> Marguerite Roza showed that a number of districts exhibited systematic inequities between schools when actual salaries were considered (up to 30 percent differences in budget spending), typically weighted in favor of the lowest-need schools. In other words, high-poverty, high-need schools generally employed a more junior staff. See Marguerite Roza, *Educational Economics: Where Do School Funds Go?* (Washington, D.C.: The Urban Institute Press: Washington, 2010).

<sup>5</sup> *School Funding Systems: Equity, Transparency, Flexibility* (Watertown, MA: Educational Resource Strategies, 2010). [http://www.issuelab.org/resource/school\\_funding\\_systems\\_equity\\_transparency\\_flexibility](http://www.issuelab.org/resource/school_funding_systems_equity_transparency_flexibility).

<sup>6</sup> Adapted from the work of Nate Levenson, *Smarter Budgets, Smarter Schools: How to Survive and Thrive in Tight Times* (Cambridge, MA: Harvard Education Press: Cambridge, 2012). Not all school districts will have separate budgets for those items funded by federal funds. Many will have only a total operating budget, which will include state and local funding, as well as federal funds, special grants, and other revenues.

<sup>7</sup> Ideas and example adapted from Levenson. *Smarter Budgets, Smarter Schools*.

<sup>8</sup> The concept of per-unit costs in education is taken from Marguerite Roza, “Now is a Great Time to Consider the Per-Unit Cost of Everything in Education,” in *Stretching the School Dollar*, ed. Frederick M. Hess and Eric Osberg (Cambridge, MA: Harvard Education Press, 2011).

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Michael Casserly, “Managing for Results in America’s Great City Schools” in *Stretching the School Dollar*, ed. Frederick M. Hess and Eric Osberg (Cambridge, MA: Harvard Education Press, 2011).



# Appendix 1- Staffing Analysis

## Staffing Analysis Example

This appendix illustrates how the concepts described in this Best Practice could be applied, using a hypothetical school site. The example is only intended to enhance the reader’s understanding of the Best Practice concepts and is not intended to dictate a particular format or method. Rather, the districts management should use their judgment and experience to decide how to most effectively apply the Best Practice concepts in their district.

The chart below shows how staff was allocated last year across the programmatic elements at Springfield Elementary. The analytical focus of this chart shows how actual per pupil costs might be higher or lower at Springfield Elementary than other elementary schools in the district by comparing average to actual costs of Springfield Elementary to other schools. This analysis might, for example, prompt discussion during the budget process of how teachers are assigned to school sites or how schools with lower actual per pupil spending might be given additional support to make up for the presumed difference in teacher experience and/or ability. Of course, a staffing analysis could be designed to focus on other analytical questions as well, such as long-term trends in staffing (which might be of interest to rapidly growing or shrinking districts) or the funding sources for each position (if a district is trying to obtain a better understanding of the complete and comprehensive set of resources available to each school site across all funding sources, not just general operating funds).

### Springfield Elementary Prior-Year Actual Numbers

STUDENT BODY CHARACTERISTICS		
	Numbers	Percentages
Enrollment	450	100%
Free & Reduced Lunch	225	50%
English Language Learner (ELL)	45	10%
Summer School & Extended Day	113	25%
Students with Disabilities	45	10%

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**3A – Applying Cost Analysis to the Budget Process**

<b>BASE COST</b>						
<b>Instructional Personnel</b>						
	Actual FTEs	Position Cost based on Avg. Cost for School	Position Cost based on Avg. Cost for District	Total Cost by Avg. Cost for School	Total Cost by Avg. Cost for District	
Core Teachers	26	65,000	75,000	1,690,000	1,950,000	
Elective Teachers	9	65,000	70,000	585,000	630,000	
Instructional Coaches	0	70,000	75,000	0	0	
Substitutes	2.2	50,000	50,000	110,000	110,000	
Instructional Aides	8	32,000	35,000	256,000	280,000	
<b>Pupil Support Personnel</b>						
Guidance Counselor - Regular	4	57,000	60,000	228,000	240,000	
School Nurse	1	70,000	70,000	70,000	70,000	
Non-Instructional Aides	2	30,000	45,000	60,000	90,000	
Librarian	1	62,000	65,000	62,000	65,000	
Principal	1	125,000	128,000	125,000	128,000	
School Site Secretary	2	45,000	50,000	90,000	100,000	
<b>Total Personnel Cost</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>\$3,276,000</b>	<b>\$3,663,000</b>	
<b>Resources for Equipment, Supplies, And Services</b>						
						Total Cost
Instructional Materials/ Supplies						45,000
Technology						33,750
Professional Development						25,000
Student Activities, Etc.						20,000
<b>Total Cost for Resources for Equipment, Supplies, and Services</b>						<b>\$123,750</b>
				By Avg. Cost for School	By Avg. Cost for District	
<b>TOTAL BASE COST</b>				<b>\$3,399,750</b>	<b>\$3,786,750</b>	
<b>TOTAL BASE COST PER PUPIL</b>				<b>\$7,555</b>	<b>\$8,415</b>	



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SPECIALIST PERSONNEL COST						
	Actual FTEs	Position Cost based on Avg. Cost for School	Position Cost based on Avg. Cost for District	Total Cost by Avg. Cost for School	Total Cost by Avg. Cost for District	
<b>Tier 2</b>						
Tier 2 Intervention Teachers	1	65,000	75,000	65,000	75,000	
Tier 2 Intervention Aides	6	32,000	35,000	192,000	210,000	
<b>Total Tier 2 Cost</b>	<b>7</b>	<b>NA</b>	<b>NA</b>	<b>\$257,000</b>	<b>\$285,000</b>	
<b>Total Tier 2 Cost Per Tier 2 Pupil</b>				<b>\$1,142</b>	<b>\$1,267</b>	
<b>Total Tier 2 Cost By Enrollment</b>				<b>\$571</b>	<b>\$633</b>	
<b>ELL</b>						
Teachers for ELL only students	0.45	65,000	75,000	29,250	33,750	
<b>Total ELL Cost</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>\$29,250</b>	<b>\$33,750</b>	
<b>Total ELL Cost Per ELL Pupil</b>				<b>\$650</b>	<b>\$750</b>	
<b>Total ELL Cost By Enrollment</b>				<b>\$65</b>	<b>\$75</b>	
<b>Extended Day</b>						
Extended Day Teachers	1.88	65,000	75,000	122,200	141,000	
<b>Total Extended Day Cost</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>\$122,200</b>	<b>\$141,000</b>	
<b>Total Extended Day Cost Per Extended Day Pupil</b>				<b>\$1,081</b>	<b>\$1,248</b>	
<b>Total Extended Day Cost By Enrollment</b>				<b>\$272</b>	<b>\$313</b>	
<b>Summer School</b>						
Summer School Teachers	1.88	65,000	75,000	122,200	141,000	
<b>Total Summer School Cost</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>\$122,200</b>	<b>\$141,000</b>	
<b>Total Summer School Cost Per Summer School Pupil</b>				<b>\$1,081</b>	<b>\$1,248</b>	
<b>Total Summer School Cost By Enrollment</b>				<b>\$271.56</b>	<b>\$313.33</b>	
<b>Special Education</b>						
Teachers for Students with Disabilities	4	65,000	75,000	260,000	300,000	
Aides for Students with Disabilities	17	43,000	45,000	731,000	765,000	
<b>Total Special Education Cost</b>	<b>21</b>	<b>NA</b>	<b>NA</b>	<b>\$991,000</b>	<b>\$1,065,000</b>	
<b>Total Special Education Cost Per Student with Disability</b>				<b>\$22,022</b>	<b>\$23,667</b>	
<b>Total Special Education Cost By Enrollment</b>				<b>\$2,202</b>	<b>\$2,367</b>	
				<b>By Avg. Cost for School</b>	<b>By Avg. Cost for District</b>	
<b>TOTAL SPECIALIST PERSONNEL COST</b>				<b>\$1,521,650</b>	<b>\$1,665,750</b>	

Cost Grand Totals		
	By Avg. Cost for School	By Avg. Cost for District
Total Base Cost	3,399,750	3,786,750
Total Specialist Personnel Cost	1,521,650	1,665,750
<b>TOTAL COST</b>	<b>\$4,921,400</b>	<b>\$5,452,500</b>
<b>TOTAL COST PER PUPIL</b>	<b>\$10,936</b>	<b>\$12,117</b>

## Appendix 2 – Per Unit Costs

### Per Unit Cost Examples

This appendix illustrates how the concepts described in this Best Practice could be applied, using a hypothetical school site. The example is only intended to enhance the reader’s understanding of the Best Practice concepts and is not intended to dictate a particular format or method. Rather, a district’s managers should use their judgment and experience to decide how to most effectively apply the Best Practice concepts in their district. This appendix illustrates per unit costs for instructional services and per unit costs for support services.

#### Per Unit Costs for Instructional Services

The table<sup>1</sup> shows three teachers, the courses they instruct, information about their workload and compensation, and cost per student. Cost per student is the “per unit” cost and it shows this district is spending far more money per student on art classes than it is on the math classes. This might prompt the district to reconsider how it offers art classes. The table also shows how supplemental activities could be compared to regular classes. In this case, a teacher is offered a stipend separate from regular compensation to coach two volleyball teams. The table shows that the amount spent per student on volleyball is not too much lower than what is spent on the Algebra 1, perhaps prompting some useful conversations about how the district allocates resources.

Teacher	Course/activity	Minutes/week	Enroll	Salary & Benefits	Stipend	Salary per activity	Cost per student
#1	Algebra 1, Sec 1	300	28			\$15,000	\$536
	Algebra 1, Sec 2	300	29			\$15,000	\$517
	Algebra 2, Sec 3	300	23	\$75,000	N/A	\$15,000	\$652
	Geometry, Sec 6	300	22			\$15,000	\$682
	Geometry, Sec 7	300	21			\$15,000	\$714
#2	Art, Sec 2	300	18			\$15,000	\$833
	Art, Sec 3	300	16			\$15,000	\$938
	Health, Sec 5	300	29	\$60,000	N/A	\$15,000	\$517
	Health, Sec 6	300	26			\$15,000	\$577
#3	Volley ball, Team 1	270	12			\$6,000	\$500
	Volley ball, Team 2	270	12	N/A	\$12,000	\$6,000	\$500

#### Per Unit Cost for Support Services

Support services can be analyzed on a per unit basis, using metrics such as cost per invoice processed or cost per payroll check produced. The following examples come from The Council of the Great City Schools Performance Management System:

## A/P Cost per Invoice

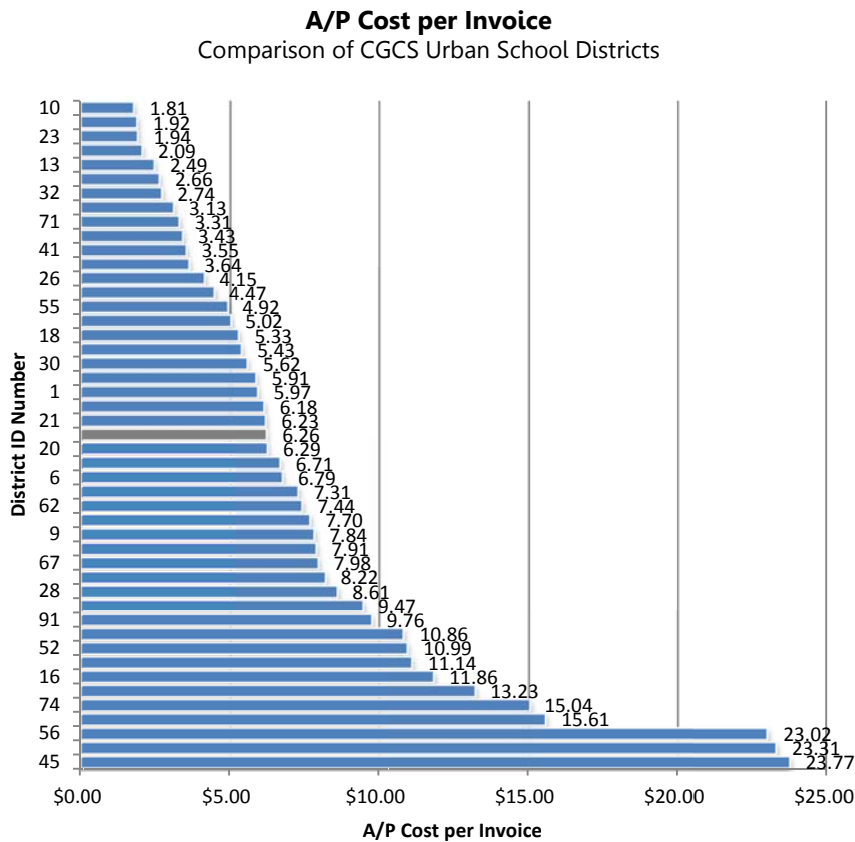
### Importance

Accounts Payable (A/P) cost per invoice measures determines the average cost to process an invoice. According to the Institute of Management, the cost to handle an invoice is the second most used metric in benchmarking A/P operations.

### Factors that Influence

- Administrative policies and procedures
- Administrative organizational structure
- Administrative leadership style, decision-making process, and distribution of organizational authority
- Departmental and individual employee responsibilities and competencies
- Performance management systems
- Monitoring and reporting systems
- Number of FTEs in the accounts payable department
- The total dollar amount of invoices paid annually
- Level of automation
- Regional salary differentials and different processing approaches
- Number of invoices

### Example Data Set



## Payroll Cost per Paycheck

### Importance

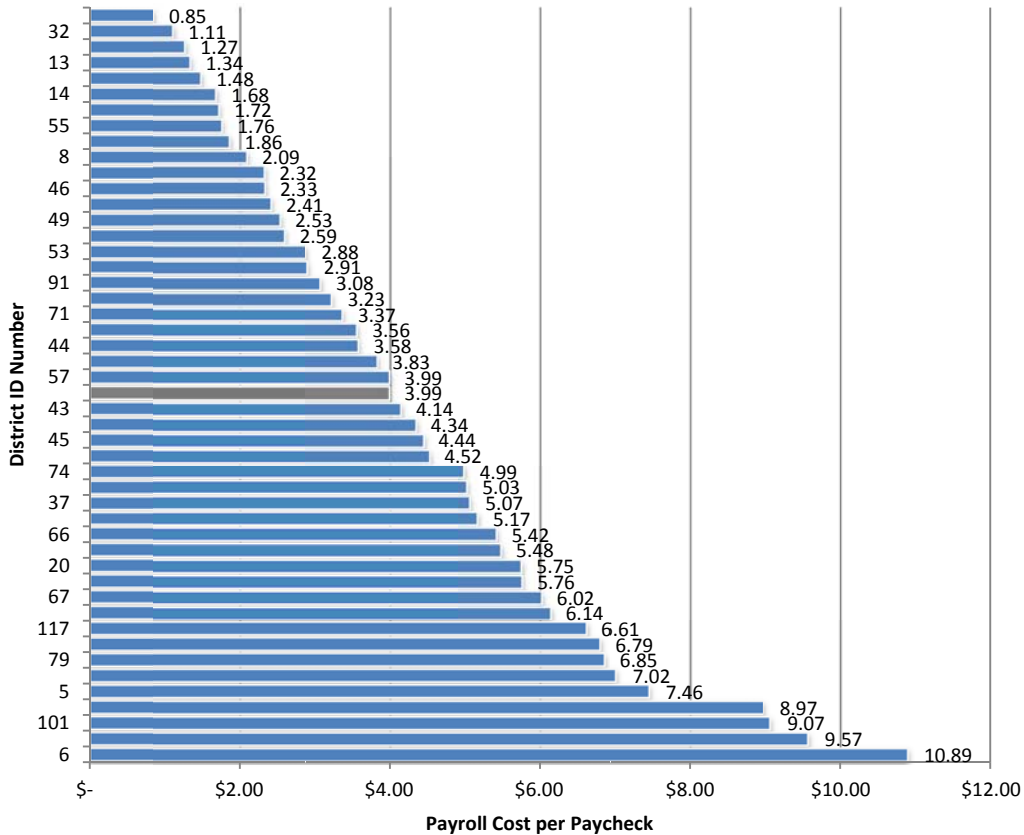
Payroll cost per paycheck measures the efficiency of the payroll operation. A higher cost could indicate an opportunity to realize efficiencies in payroll operation while a lower cost indicates a leaner, more efficient operation.

### Factors that Influence

- Number of employees processing the payroll
- Skill level of the employees processing payroll
- Types of software/hardware used to process the payroll
- Processes and procedures in place to collect payroll data
- Number of employees being paid
- Number of contracts requiring compliance
- Frequency of payrolls
- Complexity of state/local reporting requirements
- Definition of payroll

### Example Data Set

**Payroll Cost per Paycheck**  
 Comparison of CGCS Urban School Districts



## Procurement Cost per \$100K Spent

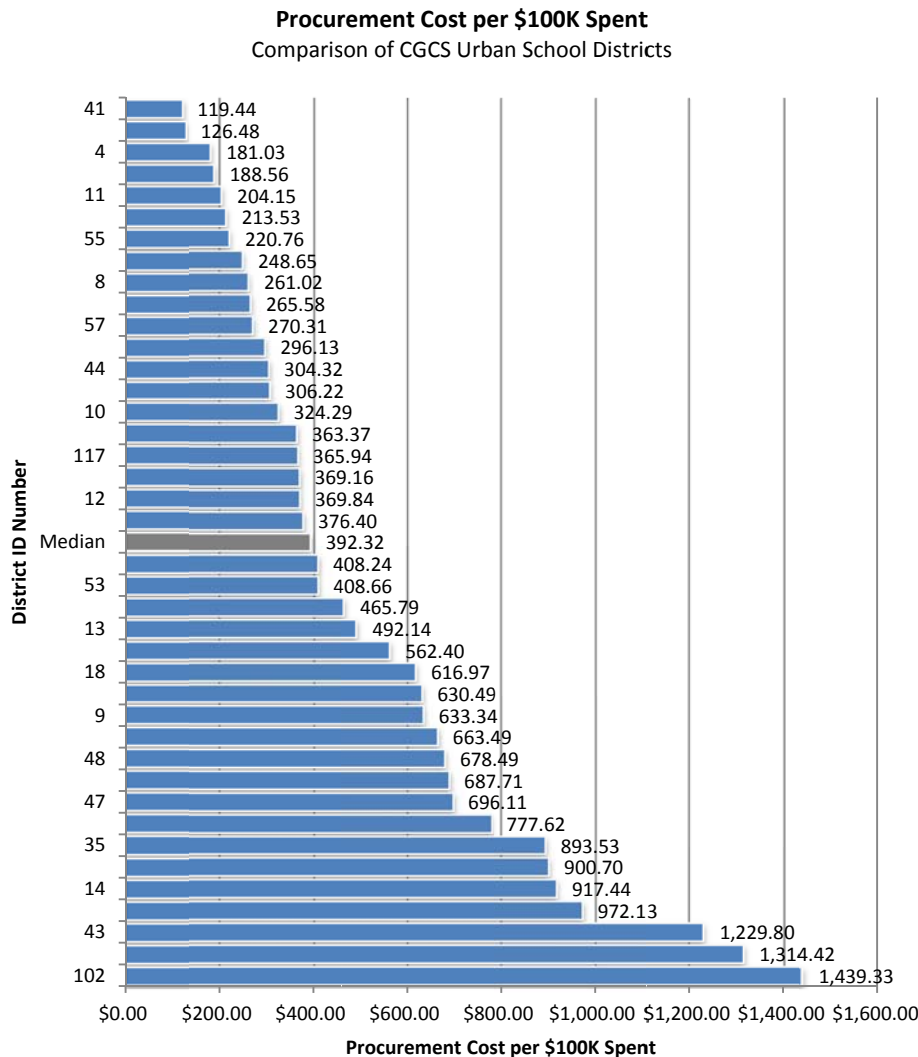
### Importance

Procurement cost per \$100,000 spent measures identifies the indirect cost of the procurement function compared to the total procurement dollars purchased by the district. Assuming all other things being equal, this is a relative measure of the administrative efficiency of district’s procurement operations.

### Factors that Influence

- Degree of P-card utilization
- e-procurement automation
- Delegation of purchasing authority
- Purchasing office professional staff grade structure, contract services, and other expenditures
- Number of highly complex procurements, especially construction
- Skill level of staff
- Definition of procurement

### Example Data Set



## Custodial Cost per Square Foot

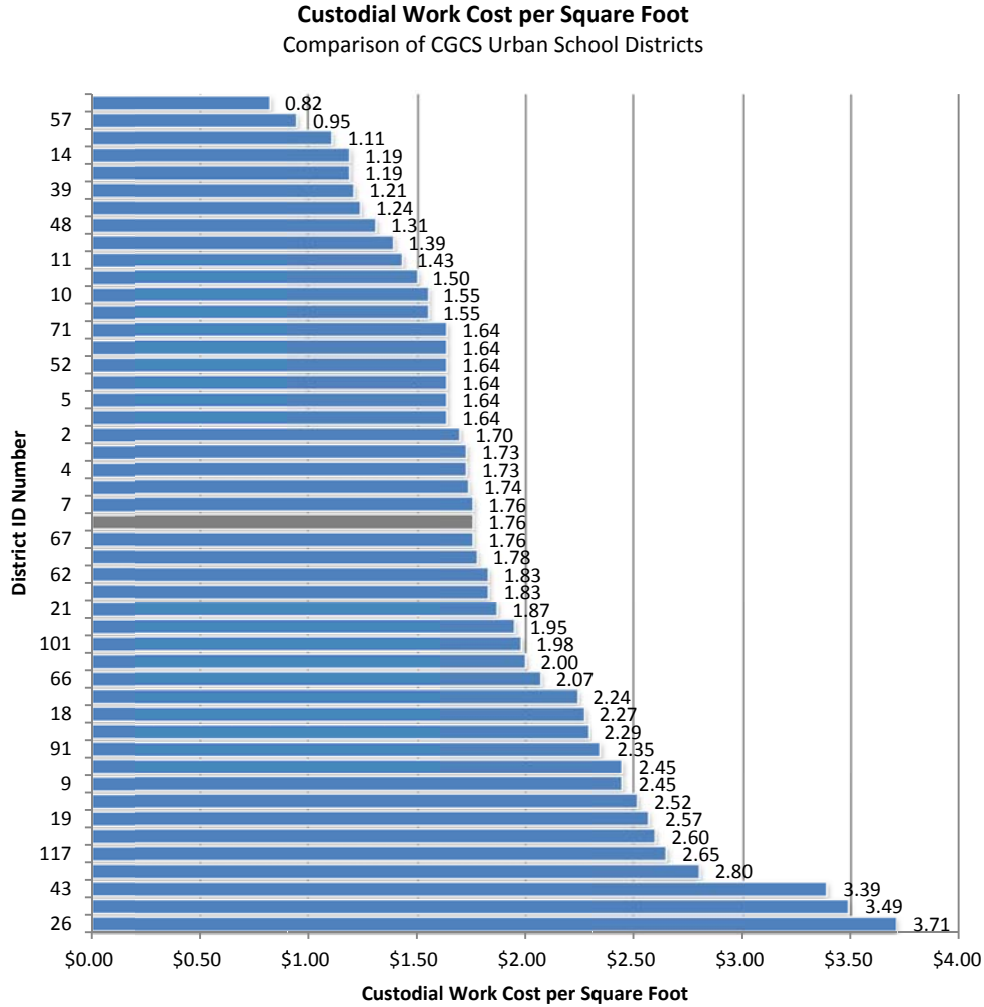
### Importance

This measure is an important indicator of the efficiency of the custodial operations. The value is impacted not only by operational effectiveness, but also by labor costs, material and supply costs, supervisory overhead costs, and other factors. This indicator can be used as an important comparison with other districts to identify opportunities for improvement in custodial operations to reduce costs.

### Factors that Influence

- Cost of labor
- Collective bargaining agreements
- Cost of supplies and materials
- Size of school
- Duties of custodian

### Example Data Set



## Transportation Cost per Mile Operated

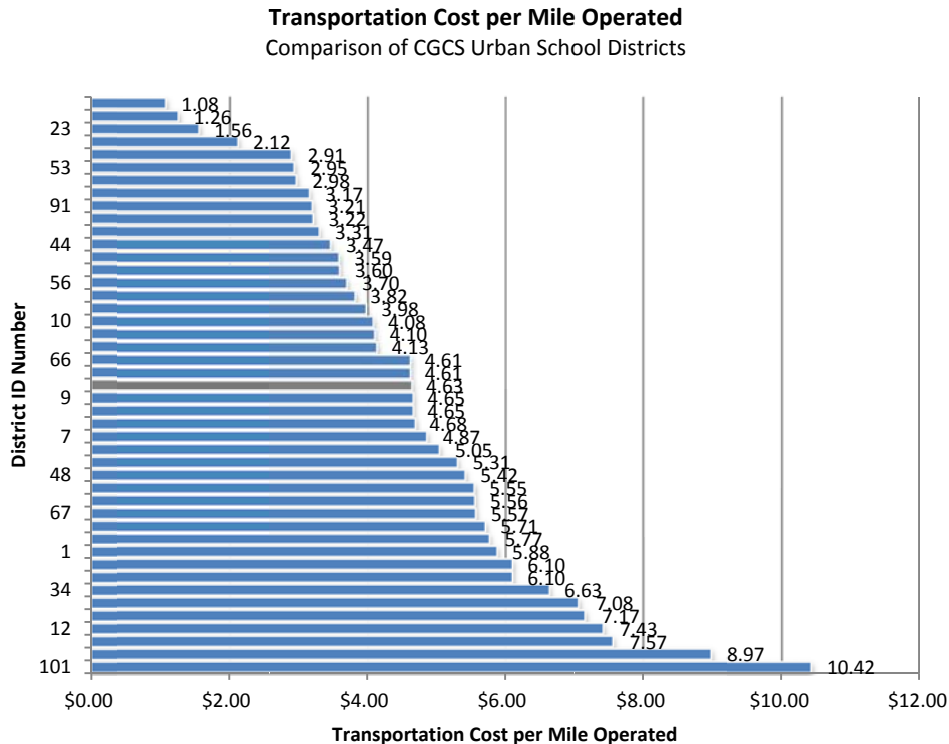
### Importance

This is a basic measurement of the cost efficiency of a pupil transportation program. It allows a baseline comparison across districts that will inevitably lead to further analysis. A greater than average cost per mile may be appropriate based on specific conditions or program requirements in a particular district. A less than average cost per mile may indicate a well-run program, or favorable conditions in a district.

### Factors that Influence

- Driver wage and benefit structure; labor contracts
- Cost of the fleet, including fleet replacement plan, facilities, fuel, insurance, and maintenance also play a role in the basic cost
- Effectiveness of the routing plan
- Ability to use each bus for more than one route or run each morning and each afternoon
- Bell schedule
- Transportation department input in proposed bell schedule changes
- Maximum riding time allowed and earliest pickup time allowed
- Type of programs served will influence costs
- Region/population served

### Example Data Set





**Endnote**

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<sup>1</sup> The table is adapted from Marguerite Roza, “Now is a Great Time to Consider the Per-Unit Cost of Everything in Education,” in *Stretching the School Dollar*, ed. Frederick M. Hess and Eric Osberg (Cambridge, MA: Harvard Education Press, 2011).

## Appendix 3 – Relative Cost per Outcome

### About Relative Cost per Outcome

Relative cost per outcome is defined as a school site's actual cost divided by the expected cost of the school site if all funding were allocated purely on per student basis. The quotient of this calculation is then plotted against the level of student performance achieved at that school site. The result is a matrix that compares school sites in the district on their relative cost and their relative achievement.

The expected cost is calculated by deriving an average dollar-per-pupil cost across the district for general students as well as special categories of students such as English Language Learners (ELL), free and reduced lunch, special education, etc. This average cost per student is then multiplied by the actual number of students in each category at a given school site. This produces the expected cost of the school, if schools were funded strictly according to the composition of their enrollment. The school site's actual spending is then divided by the expected spending to get a ratio. A ratio higher than 1.0 means the school spends more than the student-based funding formula would expect.

Student performance at the school should then be calculated by dividing the actual performance at the school site by the predicted performance, given the mix of students at the school (using the average student performance in the relevant groupings district-wide). A district should be able to adapt the method of measuring student performance that it already uses to this type of analysis.

The result is a matrix like the one below, where student outcomes are plotted against relative spending.



Each school site will fall into one of four categories relative to other schools:

- High performing, high spending
- Low performing, low spending
- High performing, low spending
- Low performing, high spending

The school site's placement in these categories would suggest certain actions. For example, for high performing, high spending schools, the district might reduce their funding or increase enrollment. High performing, low spending schools might be further investigated to see if their methods could be replicated elsewhere. High spending, low performing schools would be candidates for further-reaching interventions from the district.

## Appendix 4 – Academic ROI

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### About Academic Return on Investment

While academic return on investment (A-ROI) is an ideal form of cost effectiveness measure, school districts do not commonly use it. It is very likely, however, that school districts may need to migrate towards more rigorous cost effectiveness measures, such as A-ROI, as state and federal government, grantors, and other entities in the enabling environment for school districts require more of such rigor.<sup>1</sup> Given this possibility, this appendix describes A-ROI in greater detail, including:

- Definition of A-ROI.
- Benefits of A-ROI.
- Calculating A-ROI.
- When to use and not to use A-ROI.
- An example of A-ROI.
- Guidance on detailed application of A-ROI.

### Definition of Academic Return on Investment (A-ROI)

A-ROI is a tool used to emphasize cost effectiveness in budget decisions and help decision makers make more informed choices between different potential uses of resources. The basic formula for A-ROI appears below.<sup>2</sup>

$$\text{A-ROI} = \frac{((\text{Learning increase}) \times (\text{Number of students helped}))}{\text{Dollars spent}}$$

### Benefits of Academic Return on Investment

The key benefit of A-ROI is that it provides a clear measure of whether or not services are having their intended impact for a reasonable cost. More fundamentally, A-ROI tells a district if what it thought were good ideas for using tax dollars are actually working ideas. Further, using A-ROI makes explicit the following types of principles and policies in the budget process:

- Not all money spent with the intent to help children learn is necessarily effective.
- All money spent should lead to positive outcomes.
- Spending \$1,000 to help a student learn is better than spending \$2,000 for similar gains in learning.
- While some strategies may deliver a learning increase, these strategies also may be too expensive relative to other options to deliver similar increases.
- Money that isn't being used cost effectively should be re-directed to other purposes. Legal restrictions on funding may constrain the extent to which ineffective spending or activities can be curtailed, but A-ROI helps encourage decision makers to curtail them to the extent possible.
- A-ROI can help create alignment between district goals and financial resource utilization.

### Calculating Academic Return on Investment

The most challenging part of the A-ROI calculation is the benefit produced by the service, often defined as the increase in student learning (e.g., years' worth of growth that occur in a single year). Benefits can be estimated in the following ways:<sup>3</sup>

- **Run controlled tests.** Especially germane to newer activities, the activity can be implemented as a “pilot” or “experiment” where the students benefiting from the activity are compared with a control group to estimate the level of benefit available.
- **Look for natural experiments.** Natural differences between how students are served within the district can provide an opportunity to observe the potential benefits from expanding an activity from one part of the district to others. However, a district must consider student demographic and other characteristics when observing a natural experiment to arrive at valid conclusions.
- **Make formative assessments.** Student progress (e.g., learning growth) can be evaluated after participating in the activity.
- **Establish and monitor other salient measures.** For example, an activity intended to prevent dropouts should have a noticeable impact on the dropout rate.

Costs are in the denominator of A-ROI. Costs should be “full costs” which include, at a minimum, the wages and fringe benefit costs of the employees performing the activities. If there are significant direct costs for equipment, outside contractors, etc., those costs should, ideally, also be included.

#### **When to Use and Not to Use Academic Return on Investment**

A-ROI is an ideal form of cost effectiveness evaluation and can be applied to a variety of different activities from specific professional development efforts, to small schools, to remediation and intervention. However, it is not applicable in all situations. Here are some guidelines for applying A-ROI judiciously.

- **Apply A-ROI strategically.** A district should not attempt to calculate A-ROI for all or even most of its services. It is likely that the time, cost, and effort needed to calculate A-ROI on such a broad scale would outweigh the benefit to decision making. Rather, A-ROI should be applied to programs that are high-profile, high-cost, or otherwise of special strategic significance.
- **Apply A-ROI going forward, not backward.** Gathering the historical data to calculate A-ROI can be very challenging. Districts will likely find it more beneficial to design the systems necessary to capture the required information for A-ROI going forward and then analyze A-ROI information once it becomes available. While this will require the district to wait for solid A-ROI information up to a year after the data collection systems have been implemented, it will result in much more accurate and credible information and will conserve the district’s analytical resources.
- **Plan ahead to use A-ROI.** A-ROI analysis must be planned six to nine months ahead of when resource allocation decisions are made. Ad hoc A-ROI studies performed in response to the need to make budget cutbacks will not work. Calculating A-ROI needs to be a separate analysis step that occurs before resource allocation decisions are made.
- **Do not apply A-ROI to services without direct academic benefit.** Some services that a district provides are important but do not have a direct linkage to student learning. Support services like payroll, transportation, or food services are illustrations of this. Rather than attempting to estimate an indirect benefit to learning for these services, a district should use unit costs and performance measures, particularly measures of service outcomes, to evaluate cost effectiveness.

**Example of A-ROI**

The following is a highly simplified example of A-ROI for a general education reading intervention and a special education reading intervention in a hypothetical district.<sup>4</sup> The implication of this A-ROI finding is that this hypothetical district should seek to shift resources to the general education reading intervention. Not only does this intervention have a more cost beneficial impact, it may even prevent the need for some children to go into the less cost effective special education reading intervention.

	General Education Reading Intervention	Special Education Reading Intervention
Increase in student learning	1.5 years growth / year	0.8 years growth / year
Number of students helped	100	40
Dollars spent per year	\$2,500	\$5,000
Number of years of spending	3	10
Total dollars spent per student	\$7,500	\$50,000
Total dollars spent over time	\$750,000	\$2,000,000
A-ROI (per \$10,000 spent)	4.5	0.02

**Resources for Academic Return on Investment**

The GFOA Best Practices in School Budgeting are organized into categories identical to that of Smarter School Spending, which is a process for aligning resources (people, time, and money) with instructional priorities for improving student achievement.

A website on the Smarter School Spending process (<http://smarterschoolspending.org>) is designed to help school districts address challenges accompanying increasing pressure to improve student outcomes within the constraints of limited funding. The website provides a series of free tools and resources, including GFOA Best Practices in School Budgeting. The website is organized around a multi-step process for districts to develop and implement a strategic finance plan and budget over 9-18 months, on their own or with support from a technical assistance provider. The website also provides districts with a variety of resources from meeting materials to analytic tools that will guide districts through the financial planning and budgeting process.

The website’s tools and resources highlighted below are of greatest relevance to this Best Practice. The summaries below indicate the importance of each tool (whether it is a key resource within the Smarter School Spending framework or supplemental/additional) and where the tool can be found on the website.

<b>Measuring Impact Guide</b>
<b>Importance:</b> Key
<b>Description:</b> This guide introduces districts on ways to measure and evaluate the impact of their programs throughout the resource alignment process.
<b>Location:</b> <a href="http://smarterschoolspending.org">http://smarterschoolspending.org</a>

### Program Success Tracker

**Importance:** Key

**Description:** The Program Success Tracker is a tool helps districts to track new programs and ensure that each program is meeting its goals. This tool may be used to track multiple programs across multiple target populations and metrics. Specifically, this tool may be used to:

- Set yearly target costs and outcomes for each new program
- Track yearly costs and outcomes of programs
- Track outcomes of specific programs across different target populations and metrics
- Evaluate costs and outcomes at a high level by comparing outcomes to targets
- Identify ineffective programs and reassess your investments

**Location:** <http://smarterschoolspending.org>

### Cost and Return on Investment (ROI) Tool

**Importance:** Supplementary

**Description:** This tool assesses costs and return on investment (ROI) for district spending and can be used to evaluate academic programs, human capital programs, and operational programs.

**Location:** <http://smarterschoolspending.org>

### Educational Return on Investment Report 2014

**Importance:** Supplementary

**Description:** This report highlights the experience of a district's gains through the resource alignment process as well as provides an example of its program evaluation.

**Location:** <http://smarterschoolspending.org>

### Calculating Academic Return on Investment

**Importance:** Supplementary

**Description:** This issue brief provides an overview of how to calculate academic return on investment based on work conducted in districts.

**Location:** <http://smarterschoolspending.org>

**Importance:** Supplementary

**Description:** This is a report by the Center of American Progress to evaluate the productivity of almost



every major school district in the country. Districts can use this report to review the evaluation methodology as well as performance benchmarks.

**Location:** <http://smarterschoolspending.org>

### **Endnotes**

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<sup>1</sup> Based on GFOA's discussion with school district practitioners and researchers.

<sup>2</sup> Academic ROI materials are taken from Nathan Levenson, *Smarter Budgets, Smarter Schools* (Cambridge, MA: Harvard Education Press, 2012).

<sup>3</sup> Ibid.

<sup>4</sup> Example provided by school finance researcher Nate Levenson