

Applying Cost Analysis to the Budget Process

SUMMARY

Key Points

- Data on current costs and staffing are an essential input to the budget process. These data help a school 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 this 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 this 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 current costs and staffing for existing instructional strategies 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 amongst different uses of resources (e.g., larger class sizes or more instructional coaches), and may spur an investigation into new ways of providing a service.

Personnel is 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 regarding the true cost of providing a service or program.

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

I. Staffing Analysis

Background. An analysis of staffing should show the actual full-time equivalent (FTE) positions for each school site, including the associated 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.¹ However, 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.² Analyzing personnel by programmatic element provides insight into how personnel are being used, not just the number of personnel at each school site.

Examples of personnel grouped by programmatic elements include:

- 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 a "Response to Intervention (RTI)" model³), 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, paraprofessionals, 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, districts should analyze staffing by programmatic elements for each school site. Further, districts should 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.⁴ 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.⁵

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.⁶ 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.

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 may also 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 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.⁷ 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 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. Districts should 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).⁸ 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:⁹

- **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.¹⁰

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,¹¹ 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, procurement cost per \$100,000 spent can be calculated where the sum of all goods and services purchased is divided by the total cost of the procurement department.¹² 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 not always 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.

Recommendation. Districts should use per-unit costs as analytical tools only as needed to provide additional insight. Districts should not express their 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.

- **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 will likely 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.

Recommendation. Districts should 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

- ¹ Definition of a program from Robert Bland and Irene Rubin, *Budgeting: A Guide for Local Governments* (Washington, D.C.: ICMA, 1997).
- ² Note that a programmatic element is not intended to capture indirect costs.
- ³ 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 Rtl. GFOA’s best practices do not differentiate between RTI and Rtl, though the two abbreviations are sometimes used to refer to two different approaches to response to intervention.
- ⁴ 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 more junior staff. See Marguerite Roza, *Educational Economics: Where Do School Funds Go?* (Washington, D.C.: The Urban Institute Press: Washington, 2010).
- ⁵ *School Funding Systems: Equity, Transparency, Flexibility* (Watertown, MA: Educational Resource Strategies, 2010). http://www.issuelab.org/resource/school_funding_systems_equity_transparency_flexibility.
- ⁶ 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.
- ⁷ Ideas and example adapted from Levenson. *Smarter Budgets, Smarter Schools*.
- ⁸ 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).
- ⁹ Ibid.
- ¹⁰ Ibid.
- ¹¹ Ibid.
- ¹² 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).