

Now is a Great Time to Consider the Per Unit Cost of Everything in Education

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There's nothing quite like a serious fiscal crisis to inspire a sober assessment of an organization's finances. So it is with the current recession and our nation's schools. Whether policymakers are staring at the exponents on projected budget gaps, or scrutinizing budgets to find what to cut, or even sizing up the stimulus package, they are dealing with dollar signs like never before. Yet, in the frenzy of renewed interest in finances, many education officials miss the one step that can often provide the best insight into the implications of all those dollar signs. That step: convert the money into *per unit* terms.

In education, putting money in "per unit" terms often means "per student," particularly when examining those funds used more directly to serve students. For instance, many already know that the country spends an average of around \$10,000 per pupil per year on K-12 education. But for many education leaders, that's where much of the per pupil analysis ends. Rather, education finance documents summarize finances across categories, reporting instead the millions spent on teacher salaries, benefits, or debt service, or on broad categories like "instruction" and "instructional support." And then there are the reams of accounting and compliance data reported to states and federal agencies to ensure funds aren't misused in some way. What isn't clear from all this fiscal documentation, however, are the per unit costs of what it is that schools or districts deliver. For instance, what does the district spend per pupil for math, science, or physical education? What's the price tag on different sports offerings, or on counseling, or drama productions? And, how does spending on a range of efforts intended to improve teaching compare on a per teacher basis?

The practice of breaking down budgets to find the cost of what's provided is an important lens on an organization's expenditures, particularly in a time of constrained revenues. Not only can spending be broken down as a way to optimize spending on routine business and operational

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services (as is described in a different chapter on Managing for Results), but the same can be done for spending on those services more central to the organization's purpose of serving students (e.g. delivering courses, etc.). Consider the following six applications of converting dollars into per pupil, per teacher, or other per unit terms:

1. Convert big numbers to per unit costs to better convey relative magnitude.
2. Compute per unit costs of various services to enable districts and schools to look for out-of-whack spending.
3. Use per unit costs as a way to consider tradeoffs.
4. Examine per student costs across schools as the basis of school budgets.
5. Put spending in per unit costs in order to better communicate with the public.
6. Budgeting in per unit terms to stabilize the budgeting process.

For each of these applications, this chapter describes the relevance to policymakers dealing with education budgets. Where relevant, basic instructions and examples are provided drawing on over a decade's worth of fiscal analysis on school and district spending at the Center on Reinventing Public Education.

Convert Big Numbers to Per Unit Costs to Better Convey Relative Magnitude.

Recent headlines tell of proposals like a \$698 million cut to NY's schools, an \$800 million proposed cut from Alabama's state budget,¹ and cut of \$40 million from the Sarasota County district in Florida.² Surely these are large numbers, but intuitively, it is difficult to understand or compare the relative importance of such figures, in part because the federal government, states and districts operate at such large and different scales. But by converting the millions or billions to their per pupil terms, we find that the above figures would amount to cuts of \$256 per student

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in New York, \$1,082 in Alabama and \$966 in Sarasota. As Figure 1 shows, by putting the figures into the same terms (per student) that most of us use to run our own households, we can better understand and compare how significant or potentially disruptive cuts of this scale might be.

Figure 1: Using Per Unit Costs Allows for Relative Comparison of Budget Cuts

| Region | Proposed Budget Cut | Budget Cut Per Student |
|---------------------------------|--------------------------------|-------------------------------|
| New York | \$698 million | \$256 |
| Alabama | \$800 million | \$1,082 |
| Sarasota County, Florida | \$40 million | \$966 |

The same can be done with the funding provided by the American Recovery and Reinvestment Act (ARRA). Much has been made of the opportunity provided to use the one-time funds to spur innovation, reinvention, or other major overhaul of schooling. And while the funds will serve different purposes in different states, understanding the magnitude of all the zeroes in the \$100 billion ARRA figure is difficult even for a numbers junkie (like the author).³ But, when we divide this 12-figure number among the nearly 50 million public education students, the education stimulus funds translate to about \$2032 per student.⁴ If the funds are over a two-year period, they are closer to \$1000 per pupil per year, or roughly 10 percent of what our country spends on education. Those hoping schools will be overhauled ought to be looking for innovations that can be achieved within this scale. Here again, putting the funds in per pupil terms allows for better intuitive understanding of the relative magnitude of funding, and the potential for its use.

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Districts, too, can convert their bigger numbers into per pupil terms to help understand their relevance. School construction and other capital projects, for instance, often come with price tags in the millions. With simple division, districts can break these figures down in terms of the yearly cost per student over the life of the investment toward putting the cost in context. In one northwestern district, for example, a planned investment in a track and field course was scrapped after the per unit costs were made clear. The district had drafted a plan to remodel a stadium to improve the track course making it suitable to host state competitions. The project boasted an impressive lifespan of 50 years and came with a \$4.3 million price tag to be paid by local levies. The school board had decided to move ahead with the project until an analyst calculated the per unit costs.⁵ Even over 50 years, in present day dollars, with a projected track team of 40 students per year, the cost per runner per year of the course still exceeded \$2000. For a district spending only \$9000 per student, the project suddenly seemed extravagant and was scrapped. Instead, students continued to practice and compete on their existing course detached from the stadium.

Conversely, investments in information systems at first may seem shockingly expensive when confronting the total price tag. New York City's Achievement and Reporting Information System (ARIS) cost an unimaginable \$81 million, prompting concerns about the amount of funds that "could be going directly to the classroom."⁶ Broken down in per pupil terms, however, the investment is just \$81.17 per student. And if ARIS stays running for just 10 years, that initial investment becomes just \$8.11 per pupil per year – even less if the system extends out further. Compare that to the nearly \$15,000 per pupil spent by the district each year, and ARIS doesn't appear quite so expensive. For those claims that funds spent on ARIS might have been diverted back to the classroom, the question becomes: what else could have been purchased per

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classroom at a similar expense of under \$200 per classroom per year? For those who had visions that the funds spent on ARIS could have gone toward smaller classes, more teaching assistants, or other similar investments in staffing, the reality is that at \$8 per pupil, the average classroom wouldn't have seen much of any increased staffing at all.

Compute Per Unit Costs of Various Services to Enable Districts to Look for Out-of-Whack Spending.

Some of the most pertinent per unit figures are those that are computed per student on the different operations of the system. Here again, while budgets can detail spending by department (say, curriculum or food services), budgets typically miss any financial analysis that follows the money to each school building or classroom to price out the services actually delivered to students. And yet, per student spending can be computed for the various services students receive, such as for the different courses taken in high schools, or for tutoring, or even for various athletic offerings. By partitioning the primary cost drivers (usually salaries) and dividing them among their courses and students (units), the resulting analysis has surfaced some unexpected per unit costs in some schools and classrooms.

Take for example one district studied by the Center on Reinventing Public Education, where our researchers computed the cost per pupil for every course offered in the district's high schools and then looked for patterns. We found that the per pupil staffing costs for electives averaged \$512 per course, whereas math classes came in at \$328 per pupil. In another district – in a higher spending eastern city—we found that advanced placement (AP) courses came at a cost of \$1,660 per pupil, versus \$739 per pupil for regular core courses.

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While these are interesting patterns in the context of school district priorities, what may be most relevant amidst budget gaps is the use of these spending data as a way to surface practical cost-saving measures. And in fact, in a few of the districts mentioned here, the costs did prompt investigation on how to deliver the service at lower cost. In was in the process of identifying the per pupil cost of different services that district leaders were able to recognize the potential savings and then act on them.

The process of computing per unit costs of services, deemed “service costing” or “spending-on-services,” is not new in education,⁷ although it had historically been applied more as a research technique than as a management tool. In 1996, researcher David Monk and associates determined per pupil expenditures for various courses in six high schools in four New York districts. They calculated per course spending using actual teacher and aide salaries, course schedules, and course enrollments.

Then in 1999, Jay Chambers of the American Institutes for Research merged unique state-level databases containing information on teacher salaries, teacher course assignments, and course enrollment data to calculate per pupil expenditures by course for students in Ohio. The results indicated wide variation in spending by course, with some elective courses—including Latin, AP Spanish, and drafting—costing twice as much on a per pupil basis as algebra, literature, and composition.

More recently, the Council of Great City Schools launched its effort toward collecting and sharing data to enable districts to manage for efficiency (described in a different chapter of this book). While most the focus of the analysis differs in that it focuses more directly on operational services, such as transportation – and thus the units are less often students – many of the same principles are applied.

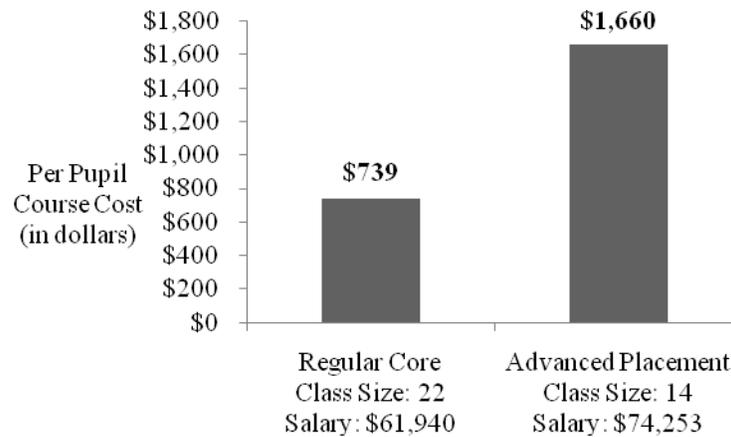
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For the two research teams focused more on spending associated with course costs, the basic approach used is the same one applied in the aforementioned districts toward cost cutting. Districts provided information on teacher salaries and stipends, teacher assignments and teaching loads, course offerings and schedules, teacher aide salaries and placements, and student participation in various courses. Each teacher's actual salary (including stipends, where relevant) was then divided proportionately among the courses taught and the number of participating students. The approach yields a per pupil expenditure based on the proportionate teacher and aide compensation. Clearly, this per pupil figure does not fully recognize all inherent expenditures (for instance, the costs of school leadership, school facilities, and district-provided shared services). It does, however, provide a means of making comparisons in spending across courses, as the excluded costs don't vary within schools.

In these districts, the results were combed for oddities — those courses where costs seemed unexpectedly high. Similarly the expenditure data were aggregated across subjects and teachers, again looking for places where the costs called attention to potential problems in how a set of courses were organized, staffed, or otherwise delivered.

Next, the key cost drivers for each course or set of courses were broken out in order to identify what was driving the high price tags. Figure 2 illustrates how key cost drivers were compared across the core and advanced placement (AP) courses in our eastern district. As is clear, the much higher costs for the AP courses stem from both smaller class sizes and higher teacher salaries.

Figure 2: Smaller classes and higher salaries drive up AP course costs



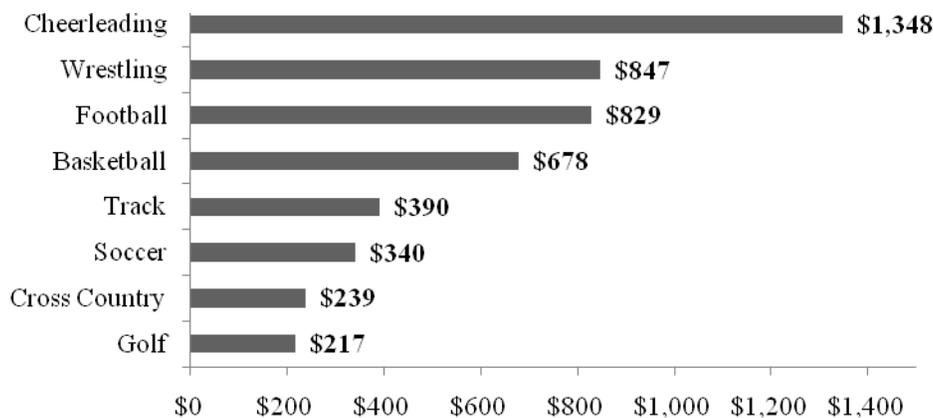
It came as no surprise that salaries were higher for AP teachers, many of whom had been teaching longer and had worked their way up in the system and into the AP courses. (In many districts, more senior teachers have preference in selecting their courses and, not surprisingly, choose honors and AP classes.) The differences in class size, however, were less expected. The district's research director looked into the issue and found that the smaller AP class sizes had been prompted by a state policy which tied funding to smaller classes for AP. The district had in turn capped these classes. What the research director quickly realized, however, was that the district didn't need to cap AP class size in order to get the state reimbursement, and thus had the option of removing the cap on AP classes as a way to save funds.

The same kind of process played out in a western district, where higher per pupil spending on music courses uncovered much smaller classes for these electives. In this case, district leaders acted on the data by combining some music course sections, freeing up funds that were then applied elsewhere.

In the same district, analysis of per pupil staffing costs for athletics suggested particularly high spending on certain sports (see Figure 3). Cheerleading, for instance, cost \$1,348 per

cheerleader, prompting a discussion of how this activity was structured. Indeed, the high relative cost was tied to the manner in which the course was offered (as a class, and also with a stipend). Intuitively, district officials recognized that there are no fundamental reasons cheerleading should cost so much. Faced with this analysis, the superintendent moved immediately to restructure the way cheerleading was offered—shifting it to an after-school sport subsidized only by the stipend, not a teacher’s salary. In the end, the effect was to lower the per pupil cost of offering cheerleading and thereby free up funds. Notice that the services weren’t eliminated, as we often hear is the only option.

Figure 3: Computing per player costs clarifies relative costs of athletics



In yet another western district, district leaders explored reducing high spending on electives by having students take some of those classes at the adjacent community center. The community center offered pottery, guitar, and other electives at a much lower price point than it was costing the district to provide these options. Unfortunately, since the district had passed a levy to pay for these electives, the district had no choice but to continue in-house delivery. The idea, however, may have some potential for districts exploring how to reduce costs without eliminating course options for students.

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Certainly it might be argued that making changes to current service delivery models will degrade the quality of the service. The community center's pottery program may indeed be inferior to the school's offering. Similarly, perhaps cheerleading is a better program when offered during class hours than when shifted to a less expensive after-school arrangement. The clear question for policymakers and school leaders is one of tradeoffs: What are the available funds, and what else could the district be doing with those funds to improve outcomes for students?

By converting spending into this more standard metric, districts can benchmark service costs against the costs for districts or from other providers. School districts can investigate per pupil costs of services like tutoring and then compare their spending to the rates offered by Sylvan Learning, for example. Custodial, security, food services, or maintenance costs can be compared to those of numerous other vendors. Our analysis of these four services revealed one district with substantially higher rates than its neighbors in the same urban region. For instance, where custodial services cost \$431 per pupil in one large district, the average for their neighbors was \$342 per student.

Clearly, benchmarking alone won't save districts money. However, understanding which other districts are providing similar services at reduced cost, and how they do so, can be the first step in deciding whether custodial or other services might be restructured or redesigned to save money.

Districts might begin to think more about per unit costs of key services as more viable alternatives emerge. For instance, as online courses advance to the point where they can replace selected course offerings, district leaders may increasingly consider the per student costs of traditional versus online options. Similarly, there are some cities where students have access to

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high quality offerings outside of schools, for sports, electives, higher-level college coursework, etc. Comparing per pupil costs of alternative offerings for students may increasingly be the first step in gauging the fiscal viability of pursuing the new alternatives.

Making the Calculations toward Identifying Savings

An important note to district leaders embarking on this kind of cost analysis is that much of the fiscal manipulations must be done on data not readily available in standard finance documents. While the data aren't difficult to access, and the metrics rely only on simple math, these kinds of cost manipulations aren't standard in most districts. The analysis requires teacher and aide salaries and stipends,⁸ course activity schedules, teacher and aide assignments, and course and activity enrollment/participation totals. As Figure 4 demonstrates, each teacher's salary (and aide's salary if relevant) is then allocated across his course sections proportionately. In our example, high school Teacher #1 earns \$50,000 and teaches five sections of math, such that \$10,000 is attributed to each section. The per section salary costs are then divided across the enrollment to get a per student cost. Weighted averages can be used to convey the per pupil costs for groups of sections or courses (say, all math classes).

Figure 4: Assign Salaries to Courses and Then Divide to Obtain a Cost per Course

| Teacher | Course/ Activity | Minutes/ Week | Enroll | Salary | Stipend | Salary per Activity | Cost per Section |
|---------|-------------------|------------------|--------|----------|---------|---------------------------|---------------------|
| #1 | Algebra I, Sec 1 | 300 | 24 | \$50,000 | N/A | \$10,000 | \$417 |
| | Algebra I, Sec 2 | 300 | 22 | | | \$10,000 | \$455 |
| | Algebra II, Sec 3 | 300 | 23 | | | \$10,000 | \$435 |
| | Geometry, Sec 6 | 300 | 22 | | | \$10,000 | \$455 |

| | | | | | | | |
|-----------|-----------------|-----|----|----------|----------|----------|-------|
| | Geometry, Sec 7 | 300 | 21 | | | \$10,000 | \$476 |
| #2 | Art, Sec 2 | 300 | 18 | \$45,000 | N/A | \$11,250 | \$625 |
| | Art, Sec 3 | 300 | 16 | | | \$11,250 | \$703 |
| | Health, Sec 5 | 300 | 29 | | | \$11,250 | \$388 |
| | Health, Sec 6 | 300 | 26 | | | \$11,250 | \$432 |
| #3 | Volleyball | 540 | 12 | N/A | \$10,000 | \$5,000 | \$417 |

After comparing the costs of different courses or groups of courses surfaces routinely higher costs for some courses, the district might then pursue cost savings with any of the following options:

- Consider consolidating some courses, perhaps for high cost electives. For example, offering one less art course (thereby raising class size in all art courses) could free up \$11,250 in the above analysis. Clearly, realizing savings would require that current staffing would shrink proportionately – a difficult assumption in many districts where sticky commitments to staff make shrinking the workforce a challenge.
- Rethink the schedule for electives. Imagine, for instance, that electives met for 60 percent of the time allocated for a core course. If course time for electives shrank by say two periods per week, and staffing for those classes were also proportionately reduced, then spending on those courses would shrink proportionately. For those districts looking to cut funds from electives, but not wanting to eliminate them altogether, scaling them back in this way could be an option.
- Investigate offering a high cost course in a different way. For example, a district might replace a specialized course with a digital online course or via a contract provider. Offering access to photography, for instance, through a community college or community

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center might yield savings. Similarly, an AP German class for just a handful of students might be more efficiently offered via an online program that charges a per student fee.

- Rethink salaries to better align funds with offerings. Let's say a district leader uncovers persistently high salaries for physical education and health teachers and the opposite in math and science where high turnover is keeping average salaries low. One option would be to concentrate funds for salary raises on those teachers where raises are needed to stem turnover, using fewer funds for those where retention has historically been high and average salaries are higher.

Use Per Unit Costs as a Way to Consider Tradeoffs.

District leaders know how difficult it is to make budget cuts. They must weigh the value and cost of different programs, compare options, and ultimately make decisions about which cuts inflict the least harm on children, staff, and the system. Clearly, not all stakeholders can objectively consider the larger picture in this same way. Rather, they understandably worry that their programs will be cut, their jobs will be eliminated, or their students will lose out.

Explaining tradeoffs in per unit terms is one way to engage stakeholders and interest groups who may have something at stake in such decisions. By moving the dialogue away from one about whether or not to eliminate a particular program, and to one centered on a range of options for cuts, district leaders may be better able to share the tradeoffs at stake.

An obvious stakeholder group is that of teachers, and with teacher salaries being the largest single expenditure in all district budgets, most proposed budget cuts will affect teachers at least in some way. Especially when district leaders propose cuts that raise class sizes, limit wage increases, or cut teacher aides, we should expect that teachers won't be thrilled. But what most

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districts don't do is lay out a range of cost cutting options, in equivalent per teacher or per student terms as a way to help communicate what's at stake.

By way of illustration, Figure 5 lists four cost equivalent cuts in *per teacher* terms that have been computed using nationally representative salary data from urban districts.⁹

Figure 5: Considering tradeoffs: How a \$4,500 Cost Cut Stacks Up Per Teacher

| | Cost Equivalent Cut |
|---------------------------|----------------------------|
| Teacher salary | \$4,500 Pay Cut |
| Pupils Per Class | 2 Added |
| Teacher Aides | 1/6 Eliminated |
| Preparation Time Per Week | 2.5 Hours Added |

Each of the options presented in Figure 5 would individually save the district approximately 3 percent of the operating budget. Faced with information like this, teachers could readily recognize how a range of cost equivalent options might affect them and express preferences on a relative basis.

And in fact, we already know something about teachers' preferences on the above list. Michael DeArmond and Dan Goldhaber, with the Center on Reinventing Public Education, surveyed teachers on their preference regarding similar cost equivalent options.¹⁰ (Though they posed the options as new spending, not reductions in spending.) They found that the majority of Washington State teachers valued their salaries at higher rates than they valued smaller class sizes, more planning time, and more help from teacher aides.

Considering tradeoffs can also be helpful when layoffs are on the table. Because of such unexpected budget gaps in 2009, many districts across the country just recently faced decisions

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on teacher layoffs. But rather than examine a set of cost-equivalent tradeoffs, many proceeded as though layoffs were the only option.

In truth, layoffs are rarely the only option. Total teacher expenditures are comprised of not just the number of teachers employed, but also days worked, wage levels, mix of staff, etc. Thus, one analysis used nationally representative data to compare options for districts to save on teacher wages, examining potential implications for the average teacher salary, layoffs per thousand teachers, and ultimately for class size.¹¹ The analysis created a hypothetical situation in which a district must cut spending by 5 percent and then spells out a set of cost equivalent options and their implications. Figure 6 demonstrates the real trade-off between layoffs and class size, on the one hand, and teacher wages on the other. As wages increase, teacher layoffs increase, and so, too, does average class size.

In Option 1, a 2 percent across-the-board increase is applied to the entire teacher salary schedule, meaning that each cell on the pay scale is increased by the same 2 percent. Teachers continue to move from cell to cell each year as they gain experience and education credits, but the 2 percent also means each cell also increases. In this option, the potential impact on teacher layoffs is 14.3 percent of the workforce, or 143 for every 1000 teachers, causing class sizes to rise by almost 17 percent. For an average class of 25 students, this would translate into roughly four additional students for a total of 29 students per class.

In Options 2 and 3, different decisions around wages work to mitigate the effect on layoffs and class size. The second simulation “freezes the schedule”, allowing teachers to continue to receive their step increases, averaging 3.16 percent, creating the need to lay off 12 percent of teachers to achieve the targeted 5 percent reduction in teacher salary expenditures.

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Resulting class sizes would increase by 13.5 percent. In the third simulation, teachers’ salaries are frozen (with no step increases), forcing a change in class size of just over 8 percent.

In the Options 4 and 5, layoffs are reduced further and class sizes are protected, as teacher wages are reduced.

Figure 6: Salary decisions can determine layoffs and class sizes

| Balancing Salary Changes and Layoffs to Meet a 5% Reduction in Teacher Salary Expenditures (After Attrition) | | | |
|--|--|----------------------------------|--|
| Options re: Teacher Salaries | For Continuing Teachers, Average Change in Salary | Layoffs Per 1000 Teachers | Percentage Increase in Class Size |
| 1. Continue with “modest” increases to overall salary schedule (2% across-the-board increase in addition to an average 3.16% increase in step change) | 5.16% | 143 | 16.7% |
| 2. Freeze current salary schedule (teachers still get the average 3.16% step change) | 3.16% | 119 | 13.5% |
| 3. Freeze all current salaries (teachers are paid what they were paid last year, with no step changes) | 0% | 75 | 8.1% |
| 4. Roll back salary schedule by 5% (but allow teachers to continue to earn step changes averaging 3.16%) | -1.84% | 47 | 4.9% |
| 5. Roll back salary schedule enough to avert layoffs while allowing for step changes (as in entire schedule would roll | -5% | 0 | 0.0% |

back by 8.16% = 5% plus 3.16% to allow
step changes)

With this kind of information, a district leader could weigh several options, all of which are cost equivalent, and select the optimal, least painful, or perhaps popular route to save 5 percent of the budget. Presented with these options, important stakeholder groups can better understand the tradeoffs and, one hopes, recognize that budget reduction decisions typically must move beyond the question of whether or not to make cuts, and focus on where to make them. If a district chooses to forego one considered budget cut, there will be one in another area.

In the spring of 2009, many districts did just the opposite. Instead of communicating their decisions as a selection of tradeoffs, they announced layoffs as though there were no other options. Teachers and parents, in many cases, vigorously opposed the layoffs. In many districts, including Seattle Public Schools, teachers picketed layoff decisions at the district's headquarters. The teachers union in Los Angeles Unified had planned a one-day walkout of school to protest layoffs, which was ultimately blocked by Los Angeles Superior Court Judge James Chalfant.

A few districts, however, did indeed put forth layoffs as one of several tradeoffs. And not surprisingly, in some, different decisions were made. Teachers in the William Floyd District in Long Island traded portions of their salaries to avert layoffs of 19 district employees.¹² Facing a similar tradeoff, the opposite decision was made in Ridgewood, New Jersey, where wage reductions were considered but ultimately rejected. In both cases, presenting options helped stakeholders understand that if the district were to forego a reduction in one area, the result would be to shift to a reduction in another area.

Similarly, the cheerleading example in the preceding section validates the power of per unit cost figures. Students, parents and citizens who care both about cheerleading and about the

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efficient and effective management of that school district might understand the superintendent's action. She kept the cheerleading program but at a reduced cost and, in the bargain, liberated funds for other priority education purposes. Armed with such per unit cost figures, the superintendent could persuasively communicate to all interested parties the reasoning behind her decision.

Sick days are another significant expense as districts hire substitute teachers at roughly \$100 per day. Some districts, including Marietta City Schools in Georgia, have asked teachers to cover for each other as a way to minimize these costs.¹³ With the average teacher taking just over 9 sick or personal days per school year, the total cost to the district is over \$900 per teacher in substitute fees alone. Put in terms of the cost per teacher, district leaders working to contain these expenditures might offer their teachers some monetary incentive to reduce absenteeism. For instance, a teacher might earn a portion of the savings incurred for those teachers with lower absenteeism. Using these substitute teacher rates (and assuming no H1N1 epidemic), a district could consider paying out some portion of the savings, say \$70, for each day not taken.

This idea, while seemingly bold, was hatched out of a conversation with a Colorado district's director of substitutes. As he put it, "if it is snowing at dinner time and is forecast to be sunny tomorrow, I might as well start calling in subs 'cause people live here to ski."¹⁴ He added that a lift ticket is about \$15 less during the week than on the weekends, so teachers use their days to head to the slopes. We wondered what might happen if the district offered the \$70 for each sick or personal day not taken. It certainly seems plausible that at this price, at least some teachers might think twice and opt to wait for the weekend: once the \$70 bonus was factored in, skiing on the weekend would be the better financial option.

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While we haven't yet put the notion to the test in any experimental way, the idea could make sense even without the lure of fresh powder. Imagine a dual working couple where one parent is a teacher. What happens when the couple's own child is sick and requires a parent to stay home? If the decision about which parent stays home is partially dependent on which parent is impacted financially, it makes sense that the costs of the teacher's substitute be factored in. Right now, if the teacher opts to head to work district saves money. The decision about which parent should stay home might be different if the district shared a portion of the savings with the person making the calculation. This kind of option not only computes a tradeoff (this time in per teacher terms), but also puts control of the tradeoff directly in the hands of those teachers directly affected by it.

Examine per student costs across schools as the basis of school budgets.

One way to think about the district budget is as a collection of the school budgets. Figuring out where to squeeze the district budget, then, can pit schools against each other as each vies for its share of the overall pie. These kinds of battles can take numerous forms, many of which play out in school board meetings. In one district, plans to cut music teachers invoked a demonstration at the school board meeting of a high school jazz band in an attempt to save the award winning jazz program at one high school. (It worked and the board made an exception for that school). Other principals noticed and argued for exceptions to other cuts in the name of fairness. In another district, a principal at Apple Lake school argued that her school should be spared since her programs were already less costly than those of the magnet, option, and alternative schools.¹⁵

There are districts that can sidestep some of these politics by using pupil-based formulas to pass along funds to schools. This allocation practice, usually deemed "weighted student

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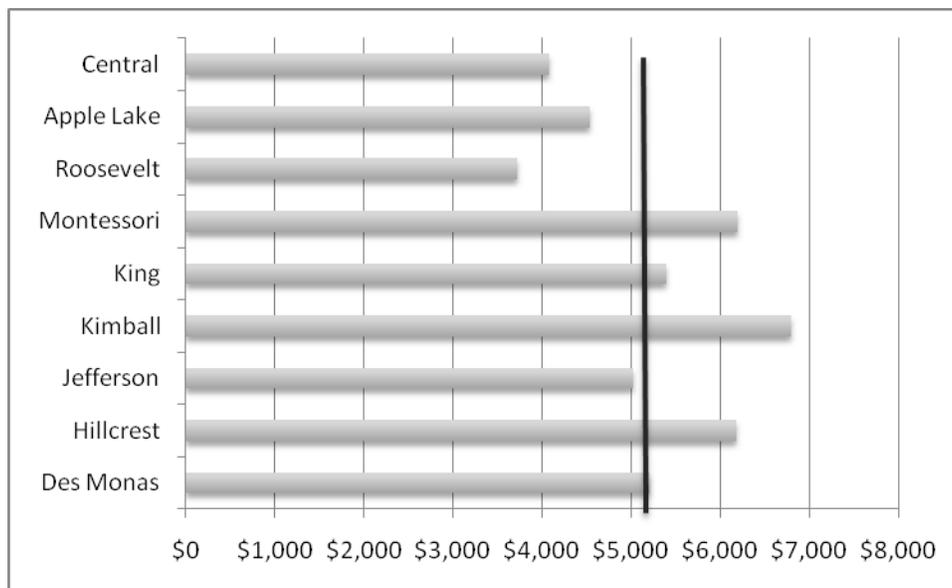
funding,” uses a formula to allocate the dollars to schools based on student types, and encourages school leaders to build their own budgets with the funds they receive. When revenues are constrained, so is the formula. Cuts are essentially passed on to schools in proportion to the number of students (weighted by their need) enrolled at each. Decisions about which schools get to save a counselor or music teacher aren’t made by district officials, but made by each school (ideally factoring in the needs of students and the local context).

Most districts, however, still rely on a staffing-based allocation model where staff full time equivalents (FTEs) are allocated to schools. Staff are allocated largely according to a staffing formula such that each school gets a teacher for every 25 students, a principal, a counselor, a reading coach, and maybe a vice principal if the school’s enrollment reaches 400, and so on. Additional staff are allocated to fund specific programs, such as a Montessori, a gifted program, or a technology magnet school. In this more common model, applying cuts means district leaders often face decisions about whether to eliminate some part of the formula—say the reading coaches or counselors—or scrap the extra staffing for special programs—such as the Montessori program or the technology magnet.

These are difficult decisions. In one school the counselor may play a more critical role than the reading coach, but the opposite may be true in another. The Montessori school may prefer to keep the extra staffing to fund the Montessori magnet, and sacrifice the counselor, but other schools may argue that they don’t have this option. Were the district to ask all schools to surrender one staff position, the Apple Lake principal might rightly cry foul as her school already receives a smaller staffing allocation than many of the district’s other schools. Then again, a school leader at a school heavily attended by at-risk students might counter that her school’s higher spending is a function of the bilingual education program, not just enrollment.

Even in districts not using the weighted student funding model, the use of a per student analysis of school spending can help enable a comparison of spending across schools, even when the schools differ in enrollment and student demographics. The idea is to identify those allocations driven by each student type and compare them to the district average spending for that student type. For instance, the staff allocations across schools may average \$5100 per pupil for each regular education student, \$6200 for each poor student, \$5800 for each non-English speaking student, and so on. Figure 7 displays the spending per regular education student across a set of schools, relative to the \$5000 district-wide average. Ultimately, the technique allows the district to compare spending for each school against a student-weighted district-wide average spending figure that represents each school's unique mix of students.¹⁶

Figure 7: Comparing each school's spending in per pupil terms can reveal deviations from the district-wide average of \$5000 per regular education student.



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In our example, such information would indeed illustrate that the mix of staff at Apple Lake comes at a lower relative per student cost than the district average. Similarly, the extra staffing at the Montessori program puts its costs above the district average.

District leaders seeking more equity in applying cuts might start by working with those more pricey schools to get their costs in line with district averages. A more rational and formulaic approach may ultimately prove to counter the types of political pressures described earlier.

Put Spending in Per Unit Costs in Order to Better Communicate with the Public.

The previous sections describe how per unit spending can work to define tradeoffs and how districts can apply this to budget cuts. As districts face budget cuts, many will have little choice but to engage the public and explain the thinking behind seemingly unpopular decisions. The larger community can come to understand that budget reductions are about deciding where to apply cuts. Deciding against a cut in one area means pursuing one in another area. For the examples above, presentation of the per unit options can help district leaders garner support for proposed strategies, particularly those unpopular with a particular stakeholder group.

While the presentation of cost-equivalent trade-offs is still fairly uncommon, a few district leaders have recently used them to draw in the public around sensitive decisions. San Diego Unified, for instance, created a survey for community members to assess their preference among a set of potential 2009 budget cuts. By including dollar figures in the survey instrument, community members were able to consider the costs as they rank-ordered their preferred cuts.

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While the examples above illustrate how per unit costs clarify tradeoffs, per unit costs can also be used as a way to draw attention to inefficient or unproductive spending. An example from a report released in 2009 computes the per pupil expenditures associated with the teacher salary bump earned by teachers as they accumulate graduate credits and ultimately a master’s degree.¹⁷ Paying teachers more for educational credits is standard practice, despite the overwhelming evidence that indicates that additional degrees don’t yield corresponding improvements in student learning outcomes.¹⁸ The report calls attention to this problem by computing the per pupil costs of master’s bumps--\$174 per pupil nationally, with a high of \$416 per pupil in New York.

In a different example, analysis by the author computes the effect of one of the side effects of making layoff decisions based on seniority—namely that the lower salaries of junior teachers mean that more layoffs are needed to achieve a desired budget reduction. For a district using layoffs to contain salary expenditures by, say, 5 percent, under a seniority-neutral policy, 5 percent of all teachers would receive pink slips. With seniority-based layoffs, however, a 5 percent savings in total salary expenditures would require laying off 7.5 percent of all teachers (50 percent more teachers laid-off). If seniority-based layoffs were indeed applied nationally to reduce all public school salary expenditures by 5 percent, 154,000 more people would lose their jobs than under a seniority-neutral layoff policy. This is a significant effect, one not otherwise obvious without such analysis. Figure 8 shows, if salary expenditures decreased by 2 percent, 5 percent, or 10 percent, the number of teachers receiving pink slips under a seniority-neutral policy and a seniority-based policy.

Figure 8: Personnel Layoffs Under Seniority-Neutral and Seniority-Based Policies

| To Reduce Salary Expenditures By: | Projected Public Education Jobs Reduced Nationally | | | |
|-----------------------------------|--|------------------|-------------------|---|
| | Using Seniority- | Using Seniority- | Difference (Extra | % |
| | | | | |

| | Neutral Layoffs | Based Layoffs | Layoffs Attributed to Seniority) | Attributed to Seniority |
|-------|------------------------|----------------------|---|------------------------------------|
| 2.0% | 124,657 | 190,707 | 66,050 | 53.0% |
| 5.0% | 305,670 | 460,328 | 154,658 | 50.6% |
| 10.0% | 612,256 | 874,623 | 262,367 | 42.9% |

Data quantifying the effects of using seniority as the basis of layoff decisions have already affected policy. In Arizona, for instance, a new law is taking effect at the time of writing that disallows districts from making layoff decisions on the basis of seniority. In passing the law, policymakers hope to reduce the total overall layoff numbers.¹⁹

Budgeting in Per Unit Terms Can be a Way to Stabilize the Budgeting Process.

Each of the previous five sections provides tools to facilitate the budgeting cutting process. And while the current fiscal climate certainly necessitates unprecedented cutting for many districts, budget crisis is not an unprecedented event. In fact, a quick scan of education headlines from big city districts in the last decade shows dozens of districts buried in budget woes. Sometimes the stress is caused by fiscal mishaps, but more often cuts are needed in response to enrollment shifts, or run-away cost growth, or other seemingly predictable factors. Regardless of the source of fiscal stress, the outcome is nearly always disruptive as district leaders find themselves focusing on little other than budget cuts.

This section suggests that budgeting in per unit terms can be a tool toward stabilizing the budgeting process, enabling budget expansion and contraction without the all-too-familiar upheaval we've now come to expect. Even more promising, managing budgets in per unit terms

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might even be a way of containing costs and thereby averting one source of fiscal stress – that of built-in cost escalators.

As is typical in education, fixed costs and built-in cost escalators drive up spending from year to year, even without the addition of new staff or programs. Many districts faced this problem this year when, despite flat revenues (or even modest increases), balancing the budget meant making difficult cuts to avoid cost growth. In districts, unlike some other sectors, personnel expenditures act like fixed costs, in that district leaders find it difficult to cut personnel except under dramatic circumstances. Escalating costs come in many different forms, but in most cases, rising costs are prompted by rising employee salaries and pensions, but also by increases in utilities costs, obligations made in past years, etc. In districts where revenues drop further as enrollments shrink, the budget challenges are magnified.

What is it about school districts that makes them unable to shrink as revenues are flat or decline? Obviously, there is not some magic expenditure level needed for fiscally viable district operation. A scan of the 14,000 or so districts in this country shows that they can and do operate on all different budgets, and many smaller districts manage to function on per pupil revenue levels less than those of larger districts perpetually in fiscal crisis. Further, districts need only look back in time for examples of when they themselves operated at lower per pupil expenditure levels.

For many districts, it isn't that they can't exist at a lower spending level, it is the shrinking itself that creates fiscal chaos. Here's how it works: When district leaders sit down to revise their budgets, they start with last year's allocation showing the per school staffing allocation, and how much they spent on the athletic department, the American Indian-heritage program, the energy-conservation unit, or the college-readiness team. Each department,

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program, or school summarizes its expenditures in terms of personnel counted as full-time equivalents, or FTEs. FTEs are relatively bulky allocations making it difficult to make incremental or proportional cuts to departments or units. Inevitably, each unit has its own director and core administrative staff. None of these positions is linked in any meaningful way to revenues, and all of them fight for their life during budget cuts. Districts rarely if ever merge or scale back programs, so for district leaders trying to make spending cuts, the only options are to eliminate an entire program (very unpopular) or make tiny, indistinguishable adjustments to each unit's budget.

Similarly, when facing the school staffing model, making an across-the-board cut to a staffing allocation (say cutting a librarian FTE from all schools) means eliminating some key dimension of each school. For budget administrators, each program or staffing unit looks and feels like a fixed cost. And to make matters worse, these fixed costs have built-in cost escalators (via fixed salary schedules, pension obligations, rising health care commitments, etc.) driving up spending even when no new budget items are added.

One strategy for redesigning budgets toward making them more flexible, nimble, and ultimately more responsive amidst revenue fluctuations is to design them instead around per unit costs. What this means is that instead of allocating a fixed number of FTEs to each budget unit, what's allocated are per pupil amounts that are tied more directly to revenues.

As mentioned earlier, a variant of this approach, weighted-student funding now exists in a handful of larger districts for some expenditures. With weighted-student funding, school resources are allocated per pupil (or pupil type) directly to schools as a way to achieve equity and/or enable decentralized control. In this case, when revenues drop, district leaders maintain the weights, but vary the base allocation proportionately.

A much larger share of district resources could be allocated on the basis of units, not only to schools, but also to programs, departments, services, operations, administration, or other district functions. This kind of allocation model makes district-level budgeting inherently responsive to changes in revenues. As revenues decrease (or increase, for that matter), the per unit allocations vary proportionately and each unit contracts as needed to accommodate the new reality. Where high school literacy was a priority, it is still a priority. Where the district has made a commitment to summer programs, or foreign language, these programs continue, perhaps with incremental adjustments in delivery.

Clearly, budget cuts to units may mean those units need to reorganize delivery, possibly by jointly providing the service with another district or contracting out for the service on a per unit basis. But what doesn't happen is that budget cuts effectively hijack district leaders for months or more as officials go line item by line item through their budgets trying to apply cuts that wreak the least havoc on the system.

Redesigning district budgets in per unit terms isn't easy, as traditional budgeting practices are deeply rooted in district habits, and even in local politics. School board members facing re-election have been known to make promises that wreak fiscal havoc in years to come, while clearly efforts to stabilize budgets ought to begin by discontinuing the practice of making long-term spending commitments unless they can be budgeted for in present-day dollars. But the benefits of budget reform are real, not only in terms of long-term fiscal stability, but also in the sense that priorities can be articulated in district spending patterns. Perhaps most important, a stable financial infrastructure can set the stage for more stability in leadership, priorities, and strategies.

Conclusion

The goal of this chapter is to provide the reader with tools to look at expenditures in a different way toward uncovering implications for budget cuts. Rather than close by summarizing a list of suggested cuts, this chapter closes with the reminder that the kinds of analyses suggested here are good practice for districts in any fiscal climate. As with any organization, thoughtful and strategic allocation decisions depend on clear understanding of how and where resources are deployed in the context of the organization's goals. These tools are intended to provide the reader with strategies needed to make better decisions about the allocation of scarce resources across competing priorities.

But of course, we are in dire fiscal times. Districts are looking for answers to questions about what and where to cut. Many seek instructions from state or federal officials as to what programs or services can be discontinued. Some want instructions to raise class sizes, shorten the school year, or escape seat compliance regulations. But, the examples here suggest that there may not be many easy, transferrable, clean cuts that will allow district leaders to escape the tough thinking that needs to be done about how to do more with less. Rather, replacing one spending scenario with an improved one will require more thought, effort, and courage to change spending such that funds are used differently. Rather than simply eliminate electives, sports, or after school programs, the goal implied here is to figure out how to allow students access to these services by spending money in different ways and at reduced cost. Rather than continue to staff all classrooms evenly, with all teachers paid off the same scale, and all classes meeting for 55 minutes five days a week, doing more with less might mean changing some of our basic assumptions about how schooling is organized. The tools provided here for examining spending in per unit terms suggest a means for taking apart spending, uncovering key cost drivers, and

learning about tradeoffs.

While the analysis requires some dedication, it isn't undoable. Clearly many of the numbers aren't yet in standard on finance documents. That said, the analysis can be done with relatively accessible data and basic math. The resulting analysis will differ from district to district and school to school which means that the implied cuts or solutions will too.

While daunting, the promise of doing the hard work is innovation in education spending. For years, researchers have been frustrated over the weak link between education spending and outcomes for students. Ultimately, finding new and better ways to apply funds to serve our students, even if prompted by recessionary budgets, is a positive outcome. Now more than ever, calculating the costs of education shouldn't end at the cost of educating a student each year.

¹ Michele McNeil, "Governors, State Legislatures Seek Ways to Limit Damage," *Education Week*, January 5, 2009. Available online at

http://www.edweek.org/ew/articles/2009/01/07/16session_ep.h28.html

² Michele McNeil, "Districts Scrounge for Low-Pain Budget Cuts," *Education Week*, January 15, 2009. Available online at <http://www.edweek.org/ew/articles/2009/01/15/18scrounge.h28.html?tmp=619749410>

³ Since not all the money will go to K-12 education (as some will go to higher education, etc.) we should anticipate some level of expenditure of less than that in K-12 education.

⁴ Or \$1016 per student per year if expended over two years.

⁵ Based on author's conversations with district officials.

⁶ Office of the Public Advocate, "NYC Public School Principals Divided Over ARIS System, Gotbaum Survey Says," Press Release, August 20, 2009. Available online at

http://pubadvocate.nyc.gov/new_news/8.20.09ARIS.html

⁷ Marguerite Roza, "Breaking Down School Budgets," *Education Next* 9, no. 3 (Summer 2009).

⁸ For a relative comparison of costs, benefits can be excluded.

⁹ Based on author's calculations.

¹⁰ Michael DeArmond and Dan Goldhaber, "A Leap of Faith: Redesigning Teacher Compensation" (Seattle: Center for Reinventing Public Education, University of Washington, 2008).

¹¹ Marguerite Roza, "The Tradeoff Between Teacher Wages and Layoffs to Meet Budget Cuts" (Seattle: Center for Reinventing Public Education, University of Washington Bothell, 2009).

¹² Winnie Hu, "The New Math: Teachers Share Recession's Pain," *The New York Times*, May 22, 2009. Available online at <http://www.nytimes.com/2009/05/24/education/24teachers.html>

¹³ Nancy Badertscher, "Budget Cuts Target Substitute Teachers," *Atlanta Journal Constitution*, November 2, 2009. Available online at <http://www.allbusiness.com/education-training/teaching-teachers/13369637-1.html>

¹⁴ Based on interviews by the author with district leaders in a Colorado district in 2003.

¹⁵ The name of the school has been changed to protect confidential conversations with district leaders.

¹⁶ For a more complete description of the technique, see Roza, M. and Swartz, C. “School Spending Profiles: A Framework to Enlighten Resource Allocation Decisions,” *Public Budgeting and Finance* 27, no. 1 (Spring 2007).

¹⁷ Marguerite Roza and Raegen Miller, “Separation of Degrees: State-by-State Analysis of Teacher Compensation for Master’s Degrees” (Seattle: Center on Reinventing Public Education, University of Washington Bothell, 2009).

¹⁸ National Council on Teacher Quality, *Increasing the Odds: How Good Policies Can Yield Better Teachers* (Washington: 2005).

¹⁹ National Council on Teacher Quality (2009). Teacher Quality Bulletin, Vol. 10, No. 10.