RETHINKING BUDGETING

FISCAL FLUENCY MADE EASY

How finance officers can better communicate numbers using insights from behavioral science

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ABOUT GFOA

The Government Finance Officers Association (GFOA) represents over 21,000 public finance officers throughout the United States and Canada. GFOA's mission is to advance excellence in government finance. GFOA views its role as a resource, educator, facilitator, and advocate for both its members and the governments they serve and provides best practice guidance, leadership, professional development, resources and tools, networking opportunities, award programs, and advisory services.

ABOUT THE RETHINKING BUDGETING PROJECT

Local governments have long relied on incremental, line item budgeting where last year's budget becomes next year's budget with changes around the margin. Though this form of budgeting has its advantages and can be useful under circumstances of stability, it also has important disadvantages. The primary disadvantage is that it causes local governments to be slow to adapt to changing conditions. The premise of the "Rethinking Budgeting" initiative is that the public finance profession has an opportunity to update local government budgeting practices to take advantage of new ways of thinking, new technologies, and to better meet the changing needs of communities. The Rethinking Budgeting initiative will raise new and interesting ideas like those featured in this paper and will produce guidance for state and local policy makers on how to local government budget systems can be adapted to today's needs. We hope the ideas presented in this paper will spur conversation about the possibilities for rethinking budgeting. The Rethinking Budgeting initiative is a collaborative effort between the Government Finance Officers Association (GFOA) and International City/County Management Association (ICMA).

To learn more, visit gfoa.org/rethinking-budgeting.

Numbers are at the core of a public finance officer's job. A big part of the job is communicating those numbers to other people. The challenge is that numbers are not a first language for many people in the finance officer's audience. In fact, the average American has only "basic"* number skills, according to the Program for the International Assessment of Adult Competencies.[1] Even so, there are opportunities for finance officers to communicate numbers better and, in doing so, generate a better understanding of and enthusiasm for savvy financial decision-making.

For a glimpse into the possibilities, consider sports fandom. You probably have met someone who does not have exceptional math skills yet has considerable interest in the statistics for their favorite player or team. They have taken an interest in the numbers because of how the numbers are presented and the context in which they are presented. Though local government finance will likely never garner the same enthusiasm as spectator sports, public finance officers can harness at least some of the same potential.

How can we do this? Psychological science provides some insights. The book ***Making Numbers Count*** by Chip Heath and Karla Starr provides principles for communicating numbers in a way that anyone can grasp. GFOA's **Rethinking Budgeting** initiative examined this book to identify the techniques with the most potential for public finance. In this paper, we will accomplish the following:

- Briefly discuss the limits of rationality. To understand how to effectively communicate numbers, we need to know why it is hard to communicate in the first place.
- Describe the four basic building blocks of communicating numbers effectively.
- Provide examples of how the four building blocks can be applied to common communication challenges in public finance.
- Discuss the ethics of using the techniques we describe in this paper. As we will see, much of the science of communicating numbers relies on the fact that people are not purely or even mostly rational beings. Much of what we do and think is intuitive, unconscious, and driven by emotions. Effective presentations must recognize this and speak to this aspect of our minds. However, that means that these techniques could tread into ethical gray areas. If a presentation speaks to our unconscious or emotional mind, could it be seen as manipulative?

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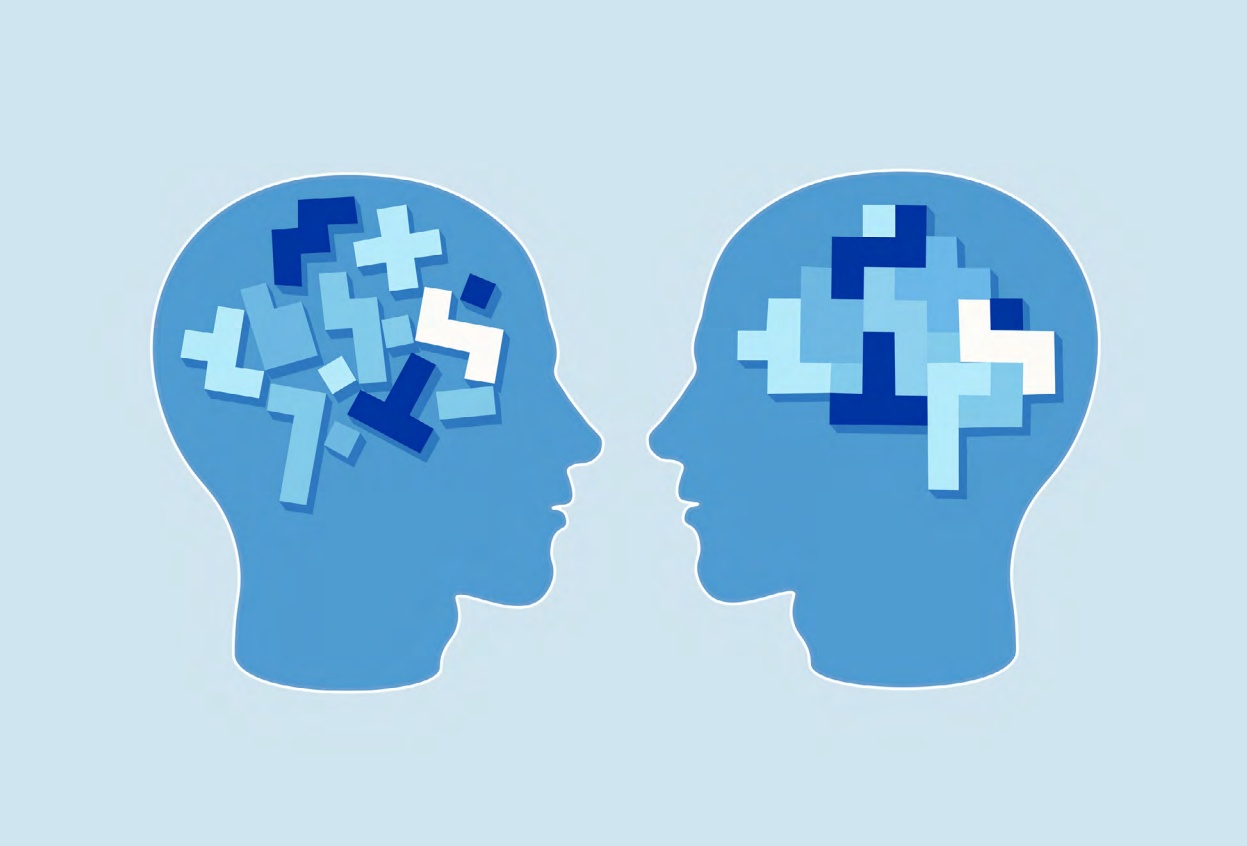
We want to see if public finance officers can make numbers count in their own governments. Share your presentation with us, and you might win a trip to the GFOA Annual Conference. Check out **gfoa.org/fiscalfluency** for details.

*"Basic" is defined as the ability to do simple calculations and interpret simple tables and graphs.



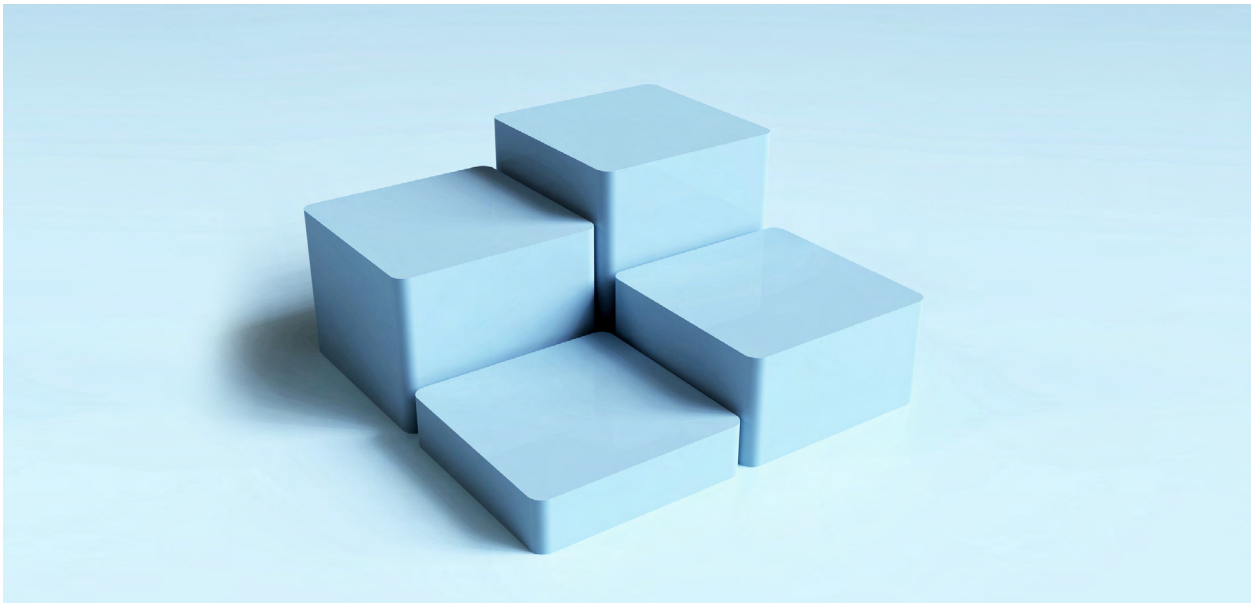
We Are of Two Minds: The Limits of Rationality

There have been important advances in our understanding of how the human mind processes information in recent decades. Researchers have identified two modes of thinking that people engage in.[2] The first is "automatic" thinking, which is fast, unconscious, and/or emotional. The second is "controlled" thinking, which is slow, conscious, effortful, and/or logical. Most of our thinking falls in the first category, "automatic," for simple reasons of biology: "Controlled" thinking takes a lot of energy. Relying on automatic thinking conserves energy—a useful feature from times in human history when food was much scarcer than it is today.

However, Western culture prizes rationality, which can lead us to overestimate its place in human cognition. This can lead us to overestimate people's ability to grasp numbers. This does not mean we should give up on rationality. It means that our efforts to present numbers must be mindful of the limits of rationality and work within those limits.

THE SPARSE HISTORICAL TRACK RECORD OF LARGE NUMBERS

The authors of *Making Numbers Count* point out that "most languages in the world and throughout history have names for the numbers 1, 2, 3, 4, and 5. But after that, the supply of numbers with names runs dry, and the language is forced to resort to a generic word such as 'lots' for all the other numbers—from 6 and 7 on up...." This shows that large numbers are not instinctive to the human mind.



The Four Building Blocks of Better Communication

We, as people, are inherently limited in our ability to grasp numbers. Numbers, by themselves, are abstract concepts. Abstractions require effortful thinking. This is why young children are taught to count objects, like fingers and toes. This makes the numbers more concrete. The numbers that public finance officers need to communicate often go well beyond what can be accommodated by fingers and toes. Large numbers can become abstract; thus, their full meaning is not well understood. To take one example, consider the phenomena of "psychological numbing." This means that the higher a number gets, the less sensitive we get to that number. To illustrate, someone might drive from one appliance store to another store across town if they discover the other store offers a $10 off sale on a $40 toaster. However, that same person would be less likely to make the trip if they discovered they could save $15 on a $1,400 television. Logically, they should make the trip. If the trip is worth $10, then it is also worth $15. But due to psychological numbing, the difference between the sale price and the full price does not feel as great for the television. Many public finance officers have witnessed a similar situation when an elected body spends a lot of energy debating a small change in a minor budget line item but soon after approves a multimillion-dollar capital project with minimal discussion.

The essence to dealing with psychological numbing and other impediments to understanding numbers (especially large numbers) is to take a cue from our childhood and transform numbers into a human experience. We can do better than fingers and toes, though. *Making Numbers Count* suggests four basic building blocks for transforming numbers into a human experience:

- Translate Numbers to Human Scale
- Help People Grasp Your Numbers
- Catalyzing Action with Emotional Numbers
- Build a Scale Model

We'll review each of these and provide examples to help explain each building block. Later in this paper, we'll show how the building blocks can be applied to common public finance questions, often using more than one building block at a time.

Translate Numbers to Human Scale

Returning to sports statistics, one of the reasons these statistics are understandable is that they typically focus on individuals. For example, we might look at the individual player's performance over the course of a game, like how many points a basketball player typically scores in a game, or how many yards a football running back gains. Some statistics even focus on individual plays by individual players, like a basketball player's free throw shooting percentage or a running back's yards per carry.

THE TRAP OF THE "IMPRESSIVE" LARGE NUMBER

It is common for communicators to present very large numbers to impress the audience. For example, the size of a city's tax base might be measured in billions of dollars. However, these extremely large numbers are abstract and hard for people to truly understand. Translating to human scale avoids this trap.

The authors of *Making Numbers Count* refer to this strategy as "focusing on one at a time." This helps make large and, otherwise, abstract numbers more concrete. Research has shown that adding even basic context can reduce error rates substantially when people need to recall facts.[3] A simple example in public finance would be to use per-capita figures in place of grand totals. For example, what is the cost per resident to add a new public service? Another example would be to show the impact on the average household. For instance, if we were to increase property taxes, what is the impact on the tax bill for an average home?

Another strategy to translate numbers to human scale is to "favor user-friendly numbers." Research has shown that the human working memory can hold around five to nine pieces of information.[4] A single numerical digit (e.g., "2") would be one piece of information. This is why, for example, telephone numbers were originally designed to be seven digits long (seven is in the middle of five to nine digits). The implication for public finance is that numbers with many digits take up more space in the audience's working memory, making it difficult for them to follow the larger message that the public finance officer wants to communicate.

The authors of *Making Numbers Count* advocate "rounding with enthusiasm" to reduce the number of digits. For example, $3,405,892 should become $3.4 million. This reduces a seven-digit number to two, leaving more room in working memory for other information.

Though numbers less than "1" are not as common in public finance, the same rule applies. Percentages, for example, are numbers below "1," and the authors of *Making Numbers Count* counsel using whole numbers to describe fractions, portions, and percentages. Exhibit 1 illustrates this concept by comparing: 1) the percent of total spending to: 2) the number of dollars spent by each department for every $10 in the budget. The second column, expressed in whole numbers, gives a clearer and memorable sense of the proportion of the spending undertaken by each department. It is true that some precision is lost. It would be up to the finance officer to determine, in each case, if the loss in precision is counterbalanced by the increase in comprehension for a wider audience. If the precision is important, the finance officer could still use whole numbers by showing how much is spent by each department per $100 in the budget. It would be the same figures in both cases (e.g., 36% for police versus $36), but the whole numbers put the figures in a more understandable context: Percentages are an abstract concept, but an audience can readily imagine having $100 and dividing it between the departments.

EXHIBIT 1 | COMPARING PERCENT OF TOTAL SPENDING TO DOLLARS SPENT

Department	Percent of Spending	For Every $10 in the Budget…
Police	36%	$4
Fire	31%	$3
Public Works	22%	$2
Administration	11%	$1

Help People Grasp Your Numbers

When we say "grasp" numbers, the use of a physical metaphor is not a mere coincidence. Tactile sensations and involving the body in learning can greatly boost understanding.[5] The authors of *Making Numbers Count* cite a survey that showed among 84 cultures, most related their units of measurement to part of the body.[6] For example, about half of the cultures have a unit of measurement based on the length of outstretched arms (called a "fathom" in English).

The lesson for public finance officers is to use simple, familiar comparisons to help people understand numbers.

The lesson for public finance officers is to use simple, familiar comparisons to help people understand numbers. For example, local government financial concepts can be related to everyday personal or consumer finance. For example, you could compare the average taxes paid per person to a common household expense like cable and streaming bills. Or you could compare the price of 16 ounces of tap water to the cost of 16 ounces of store-bought bottled water.

Another readily understood basis of comparison is time. The authors of *Making Numbers Count* point out that we may not know how far away our favorite coffee shop is in miles, but we know how long it takes to get there in minutes. In a local government finance context, figures could be compared to the amount of staff time a given amount of money would buy: "That amount of money would be enough to pay for two full-time patrol officers for an entire year."

The common theme of these examples is to relate numbers to common things and experiences in everyday life.

Catalyzing Action With Emotional Numbers

Sometimes a finance officer needs to inspire action in others. The finance officer may need to use numbers to make the case, but actions are more likely to be spurred by emotion than logic. The finance officer can fuse the logic of numbers with a presentation that engages the emotional ("automatic") part of our thinking. *Making Numbers Count* provides many potential techniques to do this; but before we review some of them, we should recognize that catalyzing action with emotional numbers poses a risk for the finance officer to tread into ethical gray areas. This is because using emotion in a presentation could be perceived as manipulative if emotion is used inappropriately. We will discuss ethics in more detail later in this paper.

The foundational technique for catalyzing action with emotional numbers is to **use a vivid comparison** to relate the number to some other experience that looms large in the minds of the audience. After the 2008 Great Recession, some creative public finance officers would compare potential new revenue problems to what the local government experienced during the Great Recession. This provided a visceral sense of the scale of response that might be required.

Another foundational technique is to subvert the audience's expectations by introducing an element of the unexpected. *Making Numbers Count* suggests **category jumping**, which means to pull the number out of the category the audience normally associates it with and put it in a new, unexpected category. Imagine a city government that runs a water and sewer utility. The utility is quite large and has a budget that is comparable in size to the general fund, but the utility tends to fade into the background during budget discussions. The finance officer believes that the elected leaders should be exercising greater oversight of the financial performance of the utilities to ensure their ongoing viability. The finance officer could point out that if the utilities were (in theory) its own government, it would have a budget equal to the city's general fund. This unexpected way of thinking about the utilities would help highlight its considerable budget.

Another way to subvert expectations is to **establish a pattern and then break it**. Imagine that a survey shows that around 40% of a city's residents think they are getting good value for their tax dollars from city government. By itself, that might not mean much and could be dismissed with a bromide like: "Well, people just don't like paying taxes." However, real-life surveys show that cities often have higher levels of satisfaction, which doesn't bode well for our hypothetical city's ongoing relationship with its taxpayers.[8] To help drive the point home, the finance officer could share the results from nearby cities with more average levels of resident satisfaction and then highlight his/her own city's score. "Six of 10 residents in the City of X are satisfied with the value they get for the taxes they pay to the municipal government. For the City of Y, it is about seven of 10 residents. In the City of Z, it is also seven of 10 residents. However, in our city, it is only four of 10 residents who are satisfied with the value of their tax dollars…or less than half." A pattern of about 60% to 70% satisfaction is established with the first three cities, and then our hypothetical city's more concerning score breaks the pattern.

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A related technique is to highlight **incomparables** or to show how the number of interest is radically different from what could be reasonable comparisons. An example in public finance could be the rate of increase in expenditures. A high rate of increase could make an object of expenditures of moderate size grow to an unmanageable size quickly. Imagine the elected board is looking at several expenditure categories of comparable size. However, one of them has been growing quickly over the past number of years such that, if the trend persists, that expenditure category will become much larger and stress the budget. The finance officer could shift the focus away from the absolute size of the spending categories (which is comparable) and put the focus toward the rate of growth (which is incomparable).

An important technique is to **make the number personal to the audience**. Imagine a recession is coming and the finance officer is forecasting a decline in revenue. The finance officer recommends slowing down hiring and freezing hiring for nonessential positions to prepare for a time of lower revenues. Because there hasn't been a conventional recession in some time,* department heads can't appreciate the gravity of the situation and don't want to change hiring practices. The finance officer could point out the number of employees each department would have to lay off if they continued hiring as they have been and if revenues decline as much as the finance officer thinks may be plausible. The finance officer could then ask each department head to think about who they would lay off. Thus, an abstract problem (future revenue decline) becomes a personal concern for the department heads.

Another way to make the number personal would be to help people touch and feel the things that public money accomplishes. For example, the City of Decatur, Georgia, held an event where people could visit a fire station and see the equipment but also included information about how the public's tax money paid for the equipment.

Finally, numbers can be **shown as a process that evolves over time**. For example, imagine that a large school district has not been keeping up on the maintenance of its school buildings, resulting in emergency repair costs. The finance officer could point out at a monthly management meeting the cost of the unscheduled repairs that will be incurred, if past trends hold, between now and the next meeting. A similar example is to highlight the cost of the unnecessary/unproductive meeting by adding up the cost of the staff time spent in the meeting.

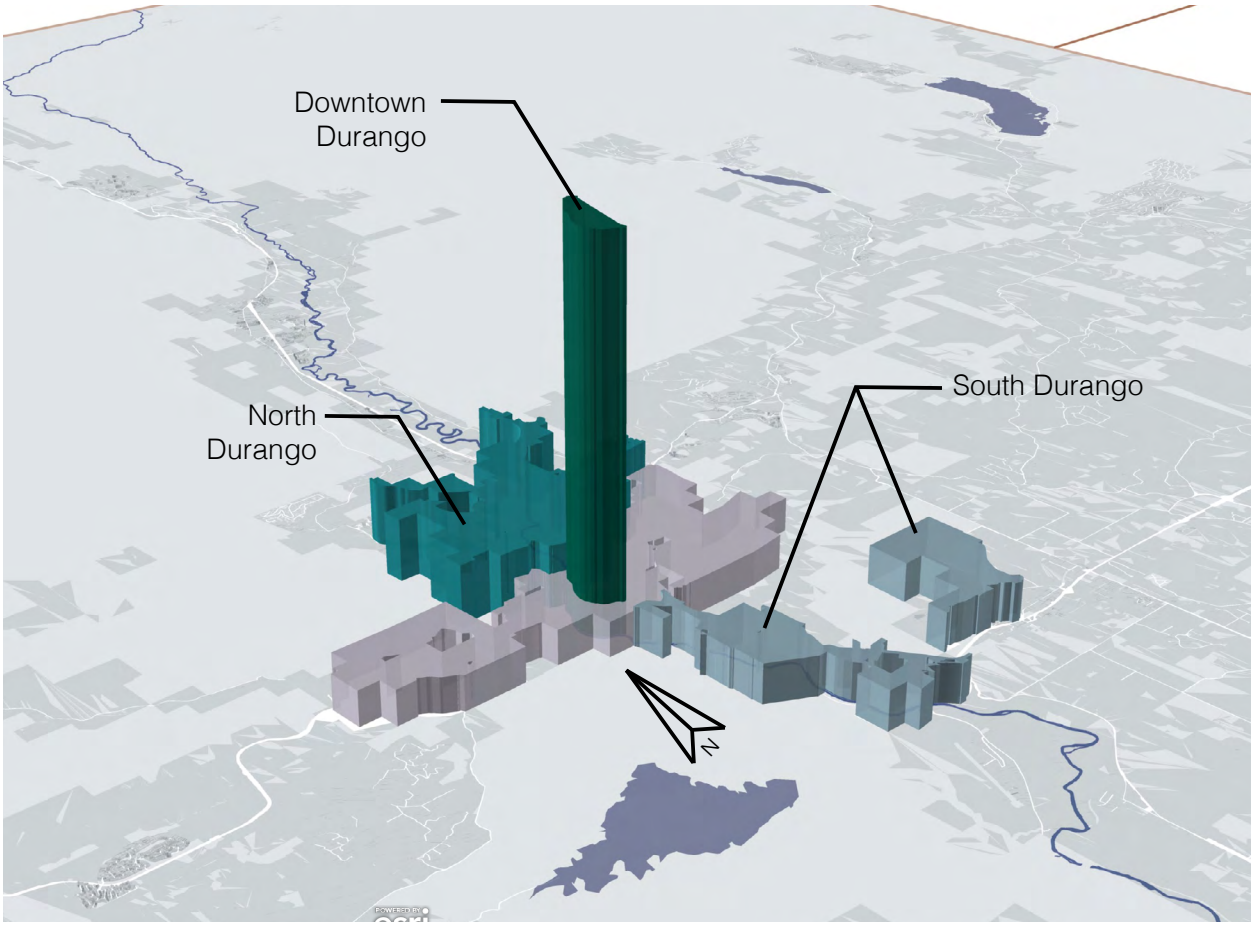
*One could argue that the economic decline associated with COVID-19 was unconventional due to the cause, length, and unprecedented federal government response.

Build a Scale Model

If you were told a house is 1,600 square feet, you might have trouble envisioning how large that is. However, if you were shown a floor plan, it would be easier to envision. Not only do scale models communicate well, but people also find them inherently interesting. Consider that maps and globes are often used as decoration, without any use for real-life navigation.

Maybe the best example of scale models in public finance is combining financial information with geospatial information. Unlike most private firms or nonprofit organizations, local governments are firmly rooted to a defined geographical area. This means some aspects of local government finance are best understood geospatially. The GFOA report **"The Root of Local Government Revenue"** provides several examples. To take one example, Exhibit 2 shows property tax per acre in various neighborhoods of Durango, Colorado. Much like a bar chart, the higher an area is raised on the map, the more revenue per acre it produces. We see on this map that the downtown area produces more property tax per acre than other areas of Durango. This is due to the density and quality of buildings found in the downtown area. It makes the point that the local governments of Durango should be mindful of how land is used, as it has important implications for the local government's ability to fund public services.

EXHIBIT 2 | **PROPERTY TAX PER ACRE FOR DURANGO, COLORADO**



Graphic courtesy of Urban3

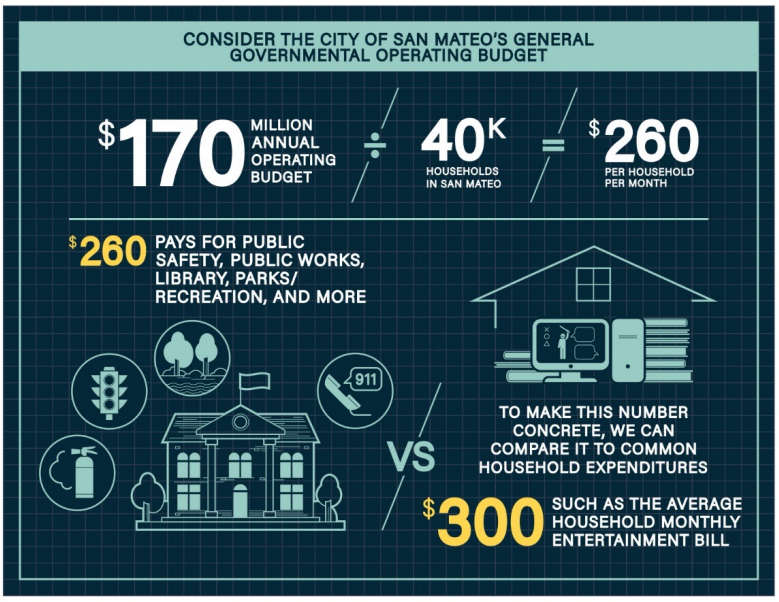
Making Numbers Count in Public Finance

In this section, we will show how the building blocks of *Making Numbers Count* could be applied to common communication challenges faced by public finance officers. Before we jump into the examples, we will note that applying the ideas of *Making Numbers Count* will require more effort and creativity than conventional tables and graphs. Therefore, we are not suggesting that finance officers apply these ideas to every number they present. Rather, these ideas can be applied to situations where the juice is worth the squeeze, like high profile, weighty issues, where it is especially important for the audience to grasp the numbers.

Challenge: Describing the value of government.

Government services have peculiar characteristics that make it difficult for individuals to appreciate the value they are getting from the service.* For instance, it is easy to appreciate the value one would get from buying groceries but more difficult to appreciate the value of paying for police, fire, and emergency medical services for community safety.

A solution could be to compare the value of government to the value of a consumer good. For example, the City of San Mateo, California, provides public safety, public works, library, parks and recreation, and city administration services. The general government operating budget is about $170 million. The city serves 103,779 people living in 40,233 households. It also has sizable nonresidential constituency, equal to about 25% of the property tax base. Thus, a single household's share of the operating budget, after deducting the share of commercial properties, comes to around $3,200 annually or about $260 per month. This figure includes more than property taxes and sales taxes; it includes **all financial contributions** that households make to the city government (e.g., taxes, fees, etc.). We could then compare this to other kinds of "operating expenditures" that households make. Let's take entertainment. According to the U.S. Bureau of Labor Statistics, households spend about $300 per month on entertainment. So, the total financial contribution for essential services like public safety, transportation system maintenance, parks, and building safety regulations is less than what is typically spent on television/streaming, video games, movie/concert tickets, and related expenditures.



Sometimes the value of government may be harder to measure because the benefits seem less tangible than the

See page 16 for a graphical summary of the key ideas presented in this paper.

*In economics, these characteristics are known as nonexclusionary and nonrivalrous. The former means that it is not possible to exclude someone who doesn't pay for the good from receiving the benefit. For instance, a visitor to a town who hasn't paid any taxes can't be excluded from a public work service that keeps sidewalks well maintained and cleaned. Nonrivalrous means that one person's use of the service does not diminish the service for others. If I eat a meal at a restaurant, you can't also eat that meal, but we can both walk the same sidewalk to get to the restaurant.

benefits a consumer gets from buying a private good. Fortunately, there are many strategies to help with this problem.*

First, check to see who has tried to measure the value of that public service before. Especially with the availability of large language model artificial intelligence (e.g., ChatGPT), it should be easy to find out how other people have defined the value of public services in the past.

Next, you might imagine what life would be like without public service. What would the observable differences be in the world? If there is any observable difference, then it is potentially measurable.

Finally, it can help to break down the problem into component parts and think about the smaller components rather than everything at once.

Let's apply these ideas to the problem of central sewer services. It might be difficult to communicate the monetary value for sewers because there is no obvious private sector analogue. For example, one does not have to make much of a conceptual leap to compare tap water purchased from a water utility to bottled water from a grocery store. With sewer, it is not so easy.

We could start with a query to ChatGPT to see what the benefits of central sewerage are. ChatGPT returned nine different benefits when we tried it. Following our principle of breaking a problem into component parts, let's focus on just one: public health/sanitation.

It is not hard to imagine life without central sewers. That's how life was in the U.S. in the late 1800s to early 1900s. We can also look to see who else has measured the impact of sewers on public health. ChatGPT points out that a 2006 study showed that the implementation of central sewers in the U.S. resulted in about a 30% increase in life expectancy—or about 10 years. Living 10 years longer is something that might be easy for people to appreciate.

We might be able to make the example even better by comparing the cost of sewer to another source of increased life expectancy: modern medicine. According to ChatGPT, a study from the *Journal of American Medicine* showed that medical advancements, such as antibiotics, vaccinations, and improvements in cardiovascular disease treatment, accounted for approximately a five-year increase in life expectancy in the U.S. between 1960 and 2010. ChatGPT tells us that the average monthly premium for an individual health insurance plan was $456 in 2020. This could be compared to sewer utilities' typical bill (which was around $70 on average across the U.S.). That's a pretty good deal! Ten years of extra life for $70 compared to five years for $450!

There are many possibilities. For example, many sewer utilities convert used water supplies into fertilizer that is sold to commercial users in the region. Perhaps those sales could be translated to per ratepayer revenue and consequent reduction in sewer bills. This could then be compared to dividends available by investing in a private company.

A WORD OF CAUTION ABOUT AI

We used ChatGPT to show how artificial intelligence tools may be able to help you work through a problem. It is important to recognize that artificial intelligence tools are not flawless and can return incomplete or even incorrect information. Nevertheless, the tools can provide a starting point. The user can then review the suggestions from the AI and refine. For example, finding the 2006 study suggested by ChatGPT proved difficult, but a more traditional internet search found a peer reviewed article from 2017 that showed that the central sewers contributed several years of additional life for Parisians during the late 1800s and early 1900s. It would not be unreasonable to assume that Americans would also benefit similarly from sewers. Hence, the general direction suggested by the conversation with ChatGPT was still ultimately useful, though its facts needed to be checked independently.

* The strategies here are inspired by: Hubbard, D. (2014). *How to measure anything: Finding the value of intangibles in business*. 3rd Ed. Wiley.

Challenge: Justifying growth in the budget.

Stakeholders may have difficulty understanding why costs are going up and the need to pay for those costs. This challenge could be particularly germane to rapidly growing communities, but inflation also puts upward pressures on the budget that might need an explanation.

One strategy could be to show how growth, if not accommodated in the budget, would lead to diminished public services. An easily understood example is class sizes in public schools: "If we do not increase the budget to account for a growing school-age population, class sizes will rise from 25 kids per classroom to 30. Put another way, for every five kids that were in a class before, there would be six." Perhaps a city government could explain the need to expand roadways in a growing community: "Nowadays, there are three cars on our roads for every two there were before. As a result, the average commute time has increased by 15 minutes one way. That is equal to spending 2.5 more hours per week working in a five-day work week."

Inflationary pressures could be illustrated in a similar way but might focus on areas of the budget susceptible to inflation. Fuel is one such cost. A county's finance officer might point out that an annualized 10% increase in fuel costs means that the county would lose the ability to put one out of every 10 sheriff's cars on the road unless the budget is increased to compensate.

Growth in the budget needs to be paid for somehow. If tax or rate increases are being considered, the finance officer could take inspiration from our discussion of value and compare: A) the increased cost per household for government services and what that is paying for; and B) the increased cost per household for common consumer items. For example, perhaps if it is appreciated that the cost of a gallon of gas at the pump is going up, then it is easier to understand that the cost of busing kids to school is also going up.

Challenge: Describing the absolute size of the budget.

Regardless of any increases, the local government budget commands a significant amount of money. People may have difficulty understanding how large of an operation the local government is. One possibility might be to compare the total revenue of local government to notable local businesses: "If our local government were a private business with the same revenues we have today, we'd be a bigger business than firms X, Y, or Z." Another possibility might be to compare it to multiples of a single firm that people know well: "If our local government were a private business with the same revenues we have today, we'd be the equivalent of three firm X's."

Another common problem is to describe the relative spending on different departments within the government. A common solution is the classic pie chart. Pie charts are subject to a surprising amount of criticism from graphic design experts,* though we might take inspiration from pie charts to come up with a better solution. Imagine the audience is the city council. They are likely familiar with the layout of city hall. The finance officer could ask them to imagine the floor plan of city hall as the equivalent of the entire budget and then apportion (imaginary) floor space to each area of spending according to the number of dollars spent. The same idea could be applied to the council chambers, with floor space in the chambers apportioned to spending areas. This might even allow the audience to physically walk through the spending proportions. Or council members could be given actual U.S. currency coins and physically categorize the coins into the departments.

Challenge: Encouraging efficiency and cost avoidance.

Efficiency and cost avoidance are generally good things but often are not very exciting. Imagine the local government has the opportunity to take some cost-saving measures, and the finance officer wishes to raise the profile of the opportunity.

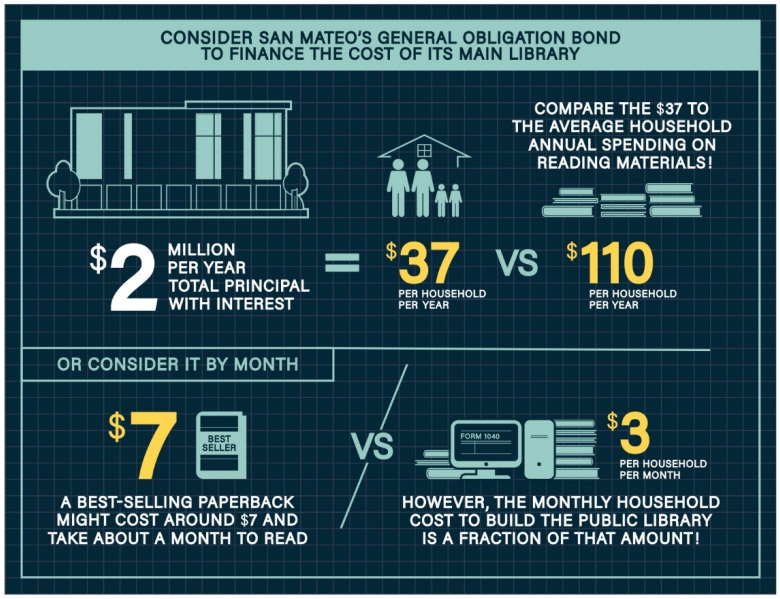
* You can read more about this in *Informed Decision-Making Through Forecasting: A Practitioner's Guide*, available through GFOA.

The finance officer could express the potential savings in person hours made available. The presentation would be made more effective if the person's hours could be translated into some other activity that the audience would find valuable. For example: "This project is estimated to save $30,000 a year in the public works department, which is the equivalent of 20 hours a week for a public works maintenance worker. Those are hours that could be used, for example, by the graffiti removal program to improve our response to graffiti to two days instead of three." This example also reminds us to be mindful of the risks and ethical gray areas of *Making Numbers Count*. For example, if it is not realistic that the saved hours could be used to accomplish graffiti removal (or whatever task is of interest), then it would be unethical to imply that they could. We'll have more discussion about the ethics of *Making Numbers Count* later in this paper.

Challenge: Communicating the burden of debt.

Capital asset financing poses not just the communication problem of the big dollar amounts involved but also the long time period over which the debt used to purchase the asset is paid back (30 years is not uncommon).

One common communication challenge is the cost to taxpayers of a new asset. A communication strategy could bring costs to the individual level and to a near-term time scale. For example, what might the equivalent costs on a daily or monthly basis be? Could that be compared to some other relevant cost?

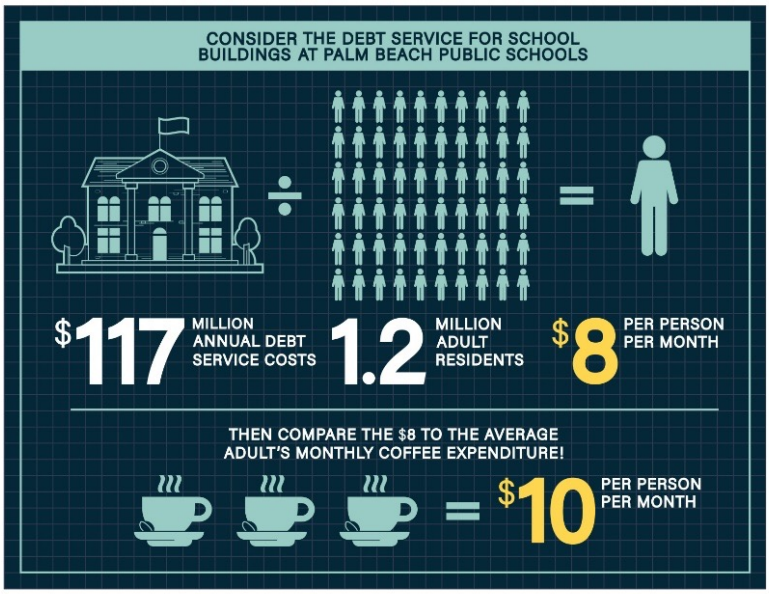


Let's take an example from the City of San Mateo. The city issued a general obligation bond to finance the cost of its main library. The total principal and interest is $2 million per year. This is about $37 per year per household or $15 per year per person in San Mateo, after considering the tax contributions from nonresidential properties in the city. These figures could then be compared to other costs that citizens incur for reading. For example, according to the Bureau of Labor Statistics, households spend about $110 per year on reading materials. Certainly, a library seems like a reasonable investment by that measure. However, "amount spent on reading materials" may still be rather abstract. We could break the costs down to per-month spend for the library bond, which is $3.10 per household or about $1.20 per person. This could then be compared to the cost to buy the latest *New York Times* Best Seller or some other popular book. For example, *The DaVinci Code* is one of the best-selling books in the last 20 years. As of this writing, you can buy a copy for about $7. Let's assume it would take a month to read *The DaVinci Code*. For a fraction of the cost of the book, you could build a library that would give you access to every novel written by the author of *The DaVinci Code*. Of course, this says nothing of the many other services the San Mateo library offers, from technology services (e.g., borrowing a tablet computer) to assistance with filing federal income taxes. Certainly, our example could incorporate these services as well.

In another example, the annual debt service for school buildings at Palm Beach Public Schools is $177 million. The adult population in the public school boundaries is 1.2 million. This equates to $98 per adult

or about $8 per month. Most adult Americans consume at least some coffee, with most consuming two or more cups each day. Whether buying from coffee shops or making coffee at home, most Americans spend at least $10 a month on coffee.[8] Hence, the cost of the average adult's monthly coffee (at least $10) is more than enough to pay for their monthly share of local school building construction.

Another option would be to show what a debt repayment stream would add to the average tax bill—or to compare the added cost to the typical monthly mortgage or rent, with the idea that housing and public assets are both kinds of "capital spending" needed for a community.



Challenge: Communicating insignificance.

Up to now, we have considered the challenges of communicating important issues. Sometimes, public finance officers have the opposite problem, where a small, insignificant issue becomes a distraction. That said, sometimes issues that **don't** have big financial implications **do** have big cultural, moral, or other implications that are not easily quantified. We are not suggesting that the finance officer dismiss these issues as a distraction. However, there are cases where an issue that is truly insignificant consumes time and attention for no good reason. For example, at one city with a $250 million operating budget, the council would spend an inordinate amount of their (and staff's) time each year debating a $10,000 contribution to a local nonprofit. In cases like this, the finance officer has good cause to redirect the conversation to something more important.

This is a good opportunity to translate money to time: "The amount we are discussing is the equivalent to two months of a single patrol officer's time. In the meantime, we have another issue on the agenda that is the equivalent of the time of six patrol officers…for an entire year each."

The Ethics of Making Numbers Count

Using more "creative" presentations of numbers does expose the finance officer to risk, especially if the presentation is designed to have an emotional impact. For example, a presentation could be seen as misleading or manipulative. The risks can be managed, though.

The first point is to avoid misrepresentation. It is obvious that intentional misrepresentation is unethical, but numbers can be presented in ways that introduce unintentional misrepresentation. For example, imagine a government has a large, unfunded, accumulated sick leave liability, and employees are paid their unused balance when they retire. To communicate the size of the liability, a well-meaning finance officer compares the size of the liability to the number of additional teachers, police officers, firefighters, etc., who could be hired with that money (e.g., total size of liability divided by average salary of a teacher). There are a few problems with this demonstration. First, if the liability were wiped away tomorrow, the government would not then have access to new funds to hire the additional staff. Second, a liability like accumulated sick leave is paid out over time (not everyone will retire this year). This means the time

* The time value of money refers to the idea that a dollar received a year from now is worth less than a dollar received today. This is due to factors like inflation and opportunity costs.

value of money must be considered.* So, the current burden the liability places on the budget is less than simply adding up the value of the current amount of unused time. Finance officers can test presentations with trusted colleagues and ask them to play devil's advocate and look for ways in which a creative presentation could be misleading.

For the second point, we turn to the role of emotion in presentations. The finance officer relies primarily on logical reasoning and a reputation for trustworthy analysis to get their message across. Emotion, though, is a tool that a finance officer may need to use at times. Emotion is an important part of how people understand the world around them. The finance officer can evaluate the ethics of an opportunity to use emotional communication by considering the following questions:[9]

- Does the communication make a useful contribution to the discussion about public finance? For example, does it help illustrate the gravity of a decision? Or does it help people better understand issues of sound public finance?
- Does the communication help move the decision process forward? For example, does it help highlight trade-offs or better engage people in the discussion?
- Is the communication consistent with a fair and accurate presentation of the underlying data? Is it consistent with the finance officer's own code of ethics?*

For example, WaterOne, a water utility near Kansas City, Kansas, was concerned about the affordability of water for low-income households. To better emphasize what the cost of water means to the individual, they began showing their board what portion of an individual's disposable income is consumed by water charges. This helped better illustrate the importance of the issue for low-income households, provided a better basis for discussing options WaterOne might have to help low-income households, and was an accurate representation of WaterOne's fee structures.

Conclusion

Numbers and the communication of numbers are essential to the role of the public finance officer. Ultimately, though, the finance officer's role is to help other public officials make better decisions and to provide assurances to the public that tax money is being used wisely. If public officials or citizens can't understand the numbers, though, the finance officer will not succeed. The strategies presented in this paper can help finance officers create the fiscal fluency necessary for good conversations about public finance and good decisions.

* See: gfoa.org/ethics

A Checklist for Fiscal Fluency

Government finance officers need to communicate numbers in a clear and understandable way. This can be difficult, since for many people numbers don't come easy. Taken from the book Making Numbers Count, the principles below are designed to help communicate with the fiscal fluency necessary for productive conversations and good decisions about public finance. To see examples of those principles in action, read the full report here.

- [ ] **Understand the limits of rationality**

  Human thinking is more automatic and less rational than we may think, often leading to an overestimation of people's ability to grasp numbers. The presentation of numbers must be mindful of those limits.

- [ ] **Translate numbers to human scale**

  Break numbers down to a level that people can easily relate to. For example, rather than the total amount of money the public would pay for a new tax, show the impact per household.

- [ ] **Help people grasp the numbers**

  Compare the numbers to those of familiar items and events in people's lives. For example, compare the cost of a public service to the cost of consumer goods or services people are familiar with.

- [ ] **Catalyze action with emotional numbers**

  When it is important to catalyze action, fuse the logic of numbers with a presentation that engages the emotions of the audiences. For example, there might be opportunities to relate the numbers to something the audience will personally experience.

- [ ] **Build a scale model**

  Use geospatial information on maps to help people visualize the impact of numbers on their communities.

ENDNOTES

[1] Goodman, M., Finnegan, R., Mohadjer, L., Krenzke, T., & Hogan, J. (2013). *Literacy, numeracy, and problem solving in technology-rich environments among U.S. adults: Results from the Program for the International Assessment of Adult Competencies 2012*: First Look (NCES 2014-008). U.S. Department of Education. Washington, DC: National Center for Education Statistics. https://nces.ed.gov/pubs2014/2014008.pdf

[2] The most well-known publication on this topic is: Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.

[3] The authors of *Making Numbers Count* cite research conducted by Microsoft as part of search engine development.

[4] Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 63(2): 81–97.

[5] Paul, A. M. (2021). *The extended mind: The power of thinking outside the brain*. Mariner Books.

[6] Cooperrider K., & Gentner, D. (2019, October). The career of measurement. *Cognition*, 191. https://bit.ly/3niVc9h
Heath, C., & Starr, K. (2022). Making numbers count: *The art and science of communicating numbers* (p. 150). Avid Reader Press / Simon & Schuster. Kindle Edition.

[7] The author would like to acknowledge Michelle Kobayashi at Polco for her insights on typical scores cities might receive on such surveys.

[8] Allen, L. (2022, July 27). 2022 coffee statistics: Consumption, purchases, and preferences. *Drive Research*. https://www.driveresearch.com/market-research-company-blog/coffee-survey/#:~:text=41%25%20of%20people%20enjoy%20or,to%203%20days%20a%20week

[9] The author would like to acknowledge Robert Bloomfield of Cornell University, Johnson School of Management and EthicalSystems.org for his contributions to this section.

FISCAL FLUENCY *MADE EASY*

Numbers are at the core of public finance officer's job. A big part of the job is communicating those numbers to other people. However, numbers are not a first language of many in finance officer's audience.

Numbers are abstract concepts. Abstractions require effortful thinking. This is why young children are taught to count objects, like fingers and toes—this makes the numbers more concrete. The numbers that public finance officers need to communicate often go well beyond what can be accommodated by fingers and toes. However, we can take a cue from our childhood and transform numbers into human experience. GFOA's research report ***Fiscal Fluency Made Easy*** provides essential strategies for transforming numbers into human experience, based on the popular book, ***Making Numbers Count***. Here, we are highlighting three ways in which large, potentially confusing numbers could be translated to human scale. Check out the report for more strategies to make fiscal fluency easy for your audience.

CONSIDER THE CITY OF SAN MATEO'S GENERAL GOVERNMENTAL OPERATING BUDGET

$170 MILLION ANNUAL OPERATING BUDGET ÷ 40K HOUSEHOLDS IN SAN MATEO = $260 PER HOUSEHOLD PER MONTH

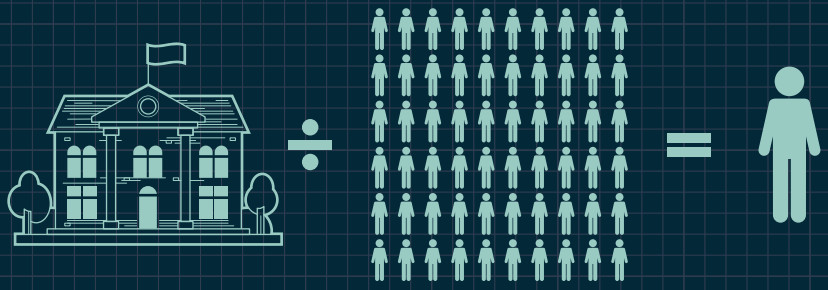
$260 PAYS FOR PUBLIC SAFETY, PUBLIC WORKS, LIBRARY, PARKS/ RECREATION, AND MORE

VS

TO MAKE THIS NUMBER CONCRETE, WE CAN COMPARE IT TO COMMON HOUSEHOLD EXPENDITURES

$300 SUCH AS THE AVERAGE HOUSEHOLD MONTHLY ENTERTAINMENT BILL

CONSIDER THE DEBT SERVICE FOR SCHOOL BUILDINGS AT PALM BEACH PUBLIC SCHOOLS

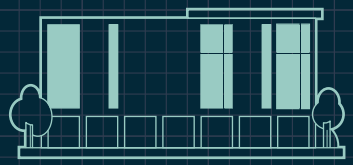


$117 MILLION ANNUAL DEBT SERVICE COSTS ÷ 1.2 MILLION ADULT RESIDENTS = $8 PER PERSON PER MONTH

THEN COMPARE THE $8 TO THE AVERAGE ADULT'S MONTHLY COFFEE EXPENDITURE!

= $10 PER PERSON PER MONTH

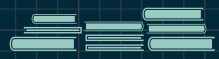
CONSIDER SAN MATEO'S GENERAL OBLIGATION BOND TO FINANCE THE COST OF ITS MAIN LIBRARY



$2 MILLION PER YEAR TOTAL PRINCIPAL WITH INTEREST =

$37 PER HOUSEHOLD PER YEAR VS $110 PER HOUSEHOLD PER YEAR

COMPARE THE $37 TO THE AVERAGE HOUSEHOLD ANNUAL SPENDING ON READING MATERIALS!



OR CONSIDER IT BY MONTH

$7

A BEST-SELLING PAPERBACK MIGHT COST AROUND $7 AND TAKE ABOUT A MONTH TO READ

VS

$3 PER HOUSEHOLD PER MONTH

HOWEVER, THE MONTHLY HOUSEHOLD COST TO BUILD THE PUBLIC LIBRARY IS A FRACTION OF THAT AMOUNT!

RETHINKING BUDGETING

gfoa.org/rethinking-budgeting

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