

A Simple Technique to Determine Budget Needs

In today's tough economy, we are all trying to find ways to use money more wisely. There is always pressure to trim the budget. This is especially true for the capital portions. However, we may not have enough money in the first place or we may actually have too much. Either way, if we don't know how much we need, we really cannot manage the budget responsibly.

In addition, some municipalities are borrowing money to pay for capital equipment or repairs to the highways. While this may be necessary in the short term, it may not make long term sense. It may be better to set up a long range capital plan and pay for new items as we go. Would you take out a loan to pay for your work clothes? If we are purchasing items every year, we really should account for this in our budget. It may be better to spend a constant amount each year, rather than borrowing money or shortchanging everyone by underspending.

The key in either case is to determine how much money is needed each year to meet the needs for capital replacement or repairs. A simple way to do this is to calculate and add together the annual costs needed each year to pay for each different budget item. The example presented here is somewhat simplified, but this annualized cost method is a good starting point for determining the amount needed in the budget. This technique can be used for all parts of the budget, including equipment, signs, and road repairs.

ANNUAL COSTS

Determine the annual costs as follows: complete an inventory; determine replacement costs; assign lifespan(s); calculate the cost per year for each item; then add the different items together. To illustrate how this works, let's look at the capital equipment portion of the budget for a typical small town, given in the example table on page 3. This shows how much money the town should have available each year to buy new equipment.

1 - Complete an Inventory

The first step is to complete an inventory of the municipalities needs. In our example, this is just a list of the large equipment. We used actual numbers from a typical average-sized town in New York State. You should make a list for your own municipality. The second column in the example table shows the number of each type of heavy equipment for our hypothetical small town.

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2 - Determine Replacement Costs

Next, you need to determine the replacement costs for each piece of equipment. You can ask other municipalities what they have spent, check the NYS Office of General Services contract bids, ask local vendors, or get information online. For our example, we searched the OGS website for current bids, and obtained prices from the 'Rock and Dirt Equipment Marketplace' website. The links are given below. The third column in the example table shows the replacement costs for each item.

Rock and Dirt Equipment Marketplace - www.rockanddirt.com

NYS Office of General Services - <http://ogs.ny.gov>

3 - Assign a Lifespan

For each different piece of equipment, you need to determine how long you plan to own it. Many of us keep equipment for an extremely long time, but we can usually estimate how long we would LIKE to own the equipment before getting it replaced. We should trade in equipment before the maintenance costs increase too much. Knowing ahead of time exactly when an item will need to be replaced is difficult, but a general estimate using actual history is a good start, especially if no other information is available. The fourth column in the example table shows the expected lifespans.

4 - Calculate the Cost per Year for Each Item

For each item in our inventory, we have to determine the average amount needed each year for eventual replacement. This is done by dividing the replacement costs by the expected lifespan. To illustrate, let's look at the 10-wheel dump truck in our example. If a dump truck costs \$130,000 and we plan to keep it for 13 years, we need to have \$10,000 each year available in a capital plan to pay for it. If we plan to keep it longer, the amount we need in the capital plan each year goes down. However, if we keep it too long, the maintenance cost may increase and offset the savings gained by keeping the truck. Column 5 shows the cost per year per piece of equipment.

Do we need to include inflation? Theoretically, yes. To do so, we would have to include the cost of borrowing money or accounting for price increases over time. Accounting for inflation requires additional funds to offset the effects of the increased costs. For our grader, with a 25 year expected life, adjusted for inflation, we would need to have over \$17,000 each year rather than the \$9,000 shown in the table. The total amount needed for all equipment jumps to \$132,000!

As an alternative to the more complicated calculation methods for determining the effects of inflation, we can simply keep increasing the amount in the budget by the amount of inflation each year. There will be a bit of a lag, since we have to wait a year to increase the budget amount, but by having a steady smaller increase we reduce the larger increases in taxes that upset the public so much.

The replacement costs estimates will need to be updated regularly. We recommend no more than three years between updates, but updating every year is even better.

	Number needed	Replacement Cost	Life Span	Cost per Year	Budget Amount
Equipment	#	\$	Years	\$/Yr	\$/Yr x #
Trucks (10 wheel) w/ plow	5	\$130,000	13	\$10,000	\$50,000
Loader	2	\$90,000	20	\$4,500	\$9,000
Grader	1	\$250,000	25	\$10,000	\$10,000
Backhoe/Excavator	1	\$180,000	15	\$12,000	\$12,000
Pick ups	2	\$12,500	5	2,500	\$5,000
Sander	5	\$8,000	30	\$267	\$1,333
Roller (5 ton)	1	\$70,000	25	\$2,800	\$2,800
TOTAL					\$90,133

5 - Determine Total Budget Needs

Finally, to determine the total budget needs, we multiply the annual cost for each piece of equipment by the number of pieces, then add these subtotals together. In the case of the 10-wheel dump trucks in the example table, there are five trucks, with an annual cost of \$10,000 apiece, so we need \$50,000 each year as the subtotal for that item. The overall formula for this calculation is as follows:

$$\text{Budget Amount} = \sum \frac{\$ \text{Cost}}{\text{Life}} \times \text{Number needed}$$

Calculate the item subtotal for every different piece of equipment in your inventory, and add these values together to arrive at a total budget need. The last column in the example table shows the total amount needed each year. On average, this town needs to spend about \$90,000 each year!

This may seem high, but imagine what will happen if we don't keep purchasing heavy equipment on a regular basis. Is your equipment too old? Have you thought about bonding for new equipment when you would rather be purchasing on a regular basis? Are you spending too much on maintenance to keep an old piece of equipment on the road?

DETAILED PLANS

Using the annual cost method, you can create a detailed plan using the budget you have available. You may also want to set up a capital reserve account to pay for very expensive items. In addition to equipment, this annual cost method can be used for roads, signs, culverts, guiderail, etc. - any item that can be inventoried. This method allows a municipality to determine how much they need on an annual basis to pay for

material and equipment. To sum up, here are the steps to follow to generate your total annual budget needs:

1. Complete an inventory of the equipment or material to be reviewed
2. Determine the current replacement cost for each item
3. Assign lifespans for each item
4. Calculate the cost per year for each item
5. Multiply the annual cost for each item by the number of items (item subtotal).
6. Add all of the separate item subtotals together to obtain the total annual budget needs

We have posted a copy of the Microsoft Excel spreadsheet we used for our example to our website at www.clrp.cornell.edu/nuggets_and_nibbles/articles/2009/capital_budget.xls

You will need to have a recent version of Excel installed on your computer in order to open the file. The Excel file contains three separate worksheets. The first sheet is blank, with the calculating formulas already built in. Simply enter the item Names, Number Needed, Replacement Cost and Lifespan. The Cost Per Year, Budget Amount (item subtotal), and the Total Budget are automatically calculated for you. The second sheet is the completed example shown above. The third sheet in the file is the completed example with an adjustment for inflation.

With a bit of work ahead of time, plus good figures and good planning, you can easily put together an accurate estimated budget that will help your agencies, and your communities, make the most of your money.



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