

## Evaluating Real Costs for Building Maintenance Management

By Joel Levitt

If I have a building that has a *replacement cost* of \$20 million, is it fair to say that I can predict some percentage of that as maintenance cost for that building based on my knowledge of its attributes? If I know, for instance, the *usage*, the *construction*, the *design*, and the *part of the country*, can I evaluate how much it should cost to maintain that building? Actually, there are ratios that can be multiplied times the value of the building to come up with projected maintenance costs.

The maintenance ratio will vary based on the following factors affecting the building: age, service or use (severe or light), and where it's located. Hiring a tradesperson in Tuscaloosa would cost a lot less than hiring that same person in New York City. Where you are in the country will have a major impact on maintenance costs.



### Special Equipment

With complicated electronic equipment, there is about a 10% cost for a service contract. Service companies can service at that rate and still make a profit. That should be the upper limit of the special equipment maintenance ratio.

### Construction Allotment

How much installation and construction work does your department do? If your department does a lot of changing around of the building, putting in offices, taking down offices, installing new equipment, running new utilities, building on minor additions – that has to be added into your budget because it's not maintenance work. It can become very difficult to manage when such work is just given as part of the maintenance responsibility.

Note the following example of a city so far behind that they can't catch-up with deterioration. In the city of Charleston, SC. there are several buildings in really bad shape, many were built around Revolutionary times. They got to a point where there were safety hazards that they had to put plywood boards over doors and windows, and no longer had to deal with those buildings. The plan may have been to fix the roof, board up the building, and figure on coming back in at a later date. In Charleston, SC, there were only 30 people to do all the work, and the physical plant was deteriorating. If they had 100 people, they could have kept the properties on an even keel.

Like Charleston you may find you are undermanned. Some places just don't have enough money, particularly in governmental buildings where (it takes an act of Congress to get more money!) you can't go back and ask for more money.

### Cost Ratio Analysis

Going back to our \$20 million building. It could be made up of 200,000 square feet that cost \$100 per square foot to build. The first thing to do is to establish is the cost of construction in that part of the country for that kind of building. For example, \$100 per square foot would not build a hospital. You could certainly build an office building for that amount, though not in New York City. The Trump Tower in New York City cost \$600 per square foot at the time it was built.

There's a new European bank that's supposed to be funding capitalism in Eastern Europe, like Poland and Hungary. Seed capital was invested, with about \$300 million to start them off. The funding came from several governments, including the US government. The bank spent \$100 million refurbishing their headquarters building. The managing director didn't like the type of marble that was on the walls. So

they had all that marble ripped out and put in new. It was perfect -- but the managing director didn't like it. This would be funny if it wasn't so tragic. Obviously, \$100 a square foot didn't cover the cost of that managing director's office.

In the case of the \$20 million building example above, there's a ratio of 1-2% for building maintenance, which brings the building maintenance budget to \$200-400,000. There is also a 10% construction ratio because about 10% of the maintenance work is actually construction or other non-maintenance work. After adding up the building

maintenance at \$400,000 and 10% for the building construction allotment, the total is about \$ \$440,000 per year for the basic maintenance budget outlay.

In some buildings, the maintenance crew is also the porters, movers, errand runners, pick-up department, etc. Now, that's not necessarily a bad thing, as long as that part of the job is recognized and documented. A real problem would be with a company that pays \$ 440,000 for maintenance, and then expects that half the work be construction or other non-maintenance jobs. There needs to be a budget line item for each job done.

Take a building with a \$1 million for the maintenance budget. How is that going to be used? It works out to be

\$2.50 per square foot (if it was 400,000 sq ft). That number doesn't mean anything unless you know what you're doing and what business you're in. \$2.50 a square foot would be high for a shopping center. You would expect

\$1.75 a square foot for a shopping center. It could be a factory, with all the specialized equipment, where \$2.50 a square foot would be more appropriate.

### **Materials and Inventories**

Labor and materials have a ratio in your business, historically, that you need to look up if you don't know what it is. Check over the budgets of the past few years. What is the ratio of parts and materials to labor?

In high speed manufacturing, for example, parts are very expensive and there can be a ratio of about 50:50 – 50%

labor and 50% materials. In the custodial business the ratio is about 85% labor and 15% materials.

Out of that \$1 million per year maintenance budget in the \$40 million building example, half is available for labor and overhead and half is available for materials. That's a ratio of 50:50. If you have \$500,000 in purchases per year, ask yourself the question, "How often do I want my inventory to turnover?" If you are maintaining a building with no special requirements, like a school, inventory won't be relevant because you would simply have vendors drop off materials as you need them, and not maintain an inventory (or a very small one at most).

If the building has specialized equipment, you'll need an inventory to maintain that equipment. If you need a bearing for a high-tech insertion machine, and it's not easily available, you'll need to have it in inventory. The accounting people will be telling you how many "turns" they want from you, meaning how many times you may turnover the dollars that are sitting on the shelf. They might want two or four turns, depending on the business. If it's two turns, you'll have half of \$500,000 on the shelf (\$250,000). If it's four turns you'll have \$125,000 on the shelf. You multiply what's on the shelf times the number of turns to get the total cost of purchases per year.

### **Thumbnail Sketch of Costs**

There are three components of labor costs that are calculated before you can assess the number of people you can hire:

- *Direct labor rate* -- what do you pay the person, not including fringes or benefits?
- *Fringe benefits* -- for a lot of people, the fringes are 30% or 40% of the base salary. If the fringes are very light, they might be 22% to 25% of the base.
- *Overhead* -- that's a calculation you can get from the accounting people; and it would include

the cost of supervision, managers, computer, office supplies, and any other costs you might add in.

In the case of the \$40 million building that might be located in a rural area with lower than average wages used here as an example, costs are \$15 per hour for *labor*, \$3 per hour for *fringes*, and \$7 per hour for *overhead*. That adds up to a cost of \$25 per hour to carry one person. Then, add in \$27.50 per overtime hour at an average of 100 hours of overtime per year per person for a total cost per person per year of about \$55,000 in that part of the country.

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**COSTS PER PERSON PER YEAR** If

you can hire labor at \$15 per hour

Fringes \$ 3 per hour

Benefits \$ 7 per

hour

Subtotal \$25 per hour x 2,080

hrs. Subtotal \$52,000 per year L,

F & B

Overtime \$27.50 per hour x 100

hrs. Subtotal \$2,750 Overtime

TOTAL \$54,750 per person per

yr.

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At \$55,000 per year for each employee, you would be able to employ nine people as well as allow for the overhead to pay a manager and a supervisor, or a clerk and a manager/supervisor.

That's the way to do a thumbnail sketch of what kind of money is involved in maintaining a particular property.

That doesn't evaluate whether what you are doing is right or wrong. If you come up with \$1 million dollars and your budget is \$800,000, there's no real problem with that. If you have \$1.2 million, there is also no problem. If, however, you have \$100,000, and the calculations show that it should be \$1 million, you have a big problem. Many maintenance people are actually in that situation.

**Management  
Decisions**

Management decisions are when management asks you to change something even though there's no driving maintenance reason to change it.

One of the biggest management areas in a building might be energy efficiency. You could be asked in a residential dorm to change all the shower heads to low-flow shower heads, for example, or retro-fit all the toilets with dams to take care of some or the water, or install a new kind of flushing mechanism that flushes a little bit or a lot. Those would be management decisions. There might be no maintenance reason, but there is a utility reason, and that would be by management decision.

For example, in one complex in South Carolina, the corporate manager went through and said he didn't like the color of the signs. So, the maintenance department had to buy and replace about 22 signs. That was not a maintenance problem. The signs were perfectly readable the way they were. But they were the wrong color according to the corporate manager. So, that was a management decision.

**Unscheduled  
Events**

Unscheduled events are emergencies and do-it-now type of events. In zero based budgeting you schedule one asset or asset class at a time. For example schedule 10 hours a year and an additional \$200 in materials for unscheduled events. This particular asset will require 32 hours per year and \$400 worth of materials. In another asset, the generator will require 54 hours a year and \$780 worth of materials.

When going through a facility, take along a list of these things, depending on how many assets there are. You may be able to aggregate – put together – some of the assets in your list. Maybe all the chillers can be put on one line, for example. However, if the chillers are very costly, it would be better to list them separately, particularly if they are of different ages and, therefore, different levels of service.

Once you build your spreadsheet, it becomes much easier to go through the assets and simply make changes as they are needed.

If you have a good computer system, you can number the assets and printout the different categories of work by asset number. You can then do a budget to actual. That will help make the next year's list more accurate.

Here's the beauty of this, when management comes to you and says you need to cut the maintenance budget, the logical question you can then fairly ask is, "Here's what the maintenance budget goes for, please tell me which assets you choose for me not to maintain. Which ones is it ok to leave out?" That becomes a very different discussion than "cut it 10%."

You won't be able to do any corrective maintenance unless you have a PM system. The PM system allows you to look at management decisions; look at the things that are not related to an asset, but are related to the whole site; and look at your social demands – be sure to add the line on for social demands. What about catastrophes? Are you in a natural catastrophe corridor? Is it likely you will have a catastrophe in the next 12 months?

Management can go through PM system document like this and say, "Well, cut out the catastrophes." Then you can respond, "Fine. But, understand, if there is a catastrophe, we'll have to go for supplemental appropriations." Of course it is possible management would say, "We have no construction schedule for catastrophes, if we do you'll get some money for that." But, at least you have documentation for your projected costs.

*Housekeeping.* The same kind of cost evaluation and documentation is done for housekeeping. In some ways, housekeeping is more dependent upon social and seasonal demands. If you have a rainy season, for example, housekeeping is influenced in a major way by the weather, much more than direct maintenance. If you have a lot more wet days, obviously you will have a lot more custodial effort needed at the entranceways. Depending on how good your catching systems are, they could influence the cleanliness of the entire environment.

*Routine cleaning.* Routine cleaning should be scheduled. You go through this every week or every day in all the different areas.

*Project work.* Project work is any custodial activity that takes place less often than once a month. Once a month you decide whether it's a project or not. Things like stripping floors and re-waxing -- major jobs where you pull everything apart, clean it, put everything back together again – become project work.

*Emergency cleaning.* Some maintenance crews may have one person who is a porter-type who does the emergency cleaning.

*Construction demands.* A construction is even worse for custodial than it is for maintenance because there's no way to keep construction debris, dirt, and airborne particles out of your heating and air conditioning systems. Construction will have a major impact on maintenance.

*Spreadsheet.* You need to set up the facility by areas on a spreadsheet: what the activity is, how often it is going to be done, how it will be measured, what the standard is, a time, perhaps a specification, and a reference number.

This is the same process -- you go through the elements and create the whole out of the elements. You will need to be specific, rather than saying, "Well, it's a big building, let's put three people in there." That, in fact, may be the normal way in a lot of places. Or you might be accustomed to saying, "We have a building here, and it takes two people; that building there is smaller, so let's put one person in there."

If your calculation is not based on true measurements, then there is no basis by which to expect that two people could do it, or one person, or 20 people. Measurement in the custodial area is encouraged because it is an area that can be measured relatively easily. Also, there are standards that are available that can easily be applied to your particular custodial problem.

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