

Notes on M&R Cost Benchmarks

Forecasts of M&R costs often rely on an objective reference point or "benchmark." Derived from surveys or statistical models, these are usually expressed in terms of cost per square foot or cost over replacement value. In some cases a benchmark is the sole basis for forecasting a facility M&R budget—especially when a long-term estimate is required, or the building inventory is large and diverse. In other cases a benchmark is used as a point of comparison, to put more detailed estimates in perspective and add credibility. In either case, M&R funding benchmarks play an important role in the distribution of scarce funds. The following is a collection of cautionary notes on the selection and use of cost benchmarks.

Surveys are often used as cost benchmarks. Drawing on a survey of actual M&R expenditures is an intuitive approach to defining a funding benchmark. Actual cost data is usually more persuasive than abstract models, and the fact that the information is drawn from a specific industry makes it even more compelling to those working in that industry. A number of organizations survey their membership for just this reason; the table below lists some of the reports commonly cited.

Facility Cost Surveys

Benchmarks. International Facility Management Association. Houston: Published periodically.

BOMA Experience Exchange Report. Building Owners and Managers Association International. Washington D.C.: Published annually.

Comparative Costs and Staffing Report for Colleges and Universities. The Association of Higher Education Facility Officers, APPA. Alexandria, VA: Published every two years.

Income and Expense Analysis [Separate reports for Office Buildings and Shopping Centers]. Institute of Real Estate Management. Chicago: Published annually.

Some surveys may not report total M&R costs. Whenever citing survey statistics it is good practice to review the actual survey questions behind the numbers. For example, at most facilities M&R expenditures are divided among annual operating budgets (usually preventive maintenance and smaller repair tasks) and projects funded from capital accounts (major repairs and renovations). Yet the surveys we have reviewed do not make this distinction clearly, either focusing exclusively on operating expenses, or being worded so vaguely that it is not clear that respondents considered capitalized costs. Our conclusion—shared by at least one survey designer—is that total M&R costs are often underreported.

Does the data support the conclusions? Too often conclusions from surveys and other sources are generalized far beyond their target audience. A recent article in *Maintenance Technology* (July-August 1996, p. 27) is a good example of the problem. The authors conclude that from a survey of 25 oil and gas plants, annual maintenance funding should be in the range of 2 percent of plant replacement value, and that this benchmark should be applicable regardless of industry. This is a breathtaking generalization that, without comment, could easily slip into budgeting folklore and affect millions in future M&R budgets.

In fact, there is abundant evidence that M&R costs vary by industry and building type (and location, and rate of use, and by choice of major components). To cite just a few examples: a 1992 nationwide survey of M&R expenditures by the Bureau of the Census found that M&R expenditures varied from \$1.34 per gsft. for lodging to \$6.27 for healthcare-related buildings; a 1987 survey prepared for the Department of Defense found that expenditures varied from 1.4 percent to 3.5 percent of replacement value, respectively, for federal agencies and private corporations; and finally, M&R costs estimates shown in the recent *Whitestone Building Maintenance and Repair Cost Reference 1996* varied from 1 to 6 percent of replacement value depending on the building model.

What do surveys really tell us? A survey of M&R costs tells us *what has been spent* in the past, not necessarily what *should have been spent* to maintain facilities. It is not a subtle distinction. Inadequate funding in the past has left many facilities with a tremendous backlog of necessary repairs that have gone undone—we estimate that nationwide M&R spending is less than 85% of the annual requirement. Studies of specific facility groups such as schools and military facilities indicate even greater backlogs. Using past spending as a guide is only going to perpetuate such underfunding. A more unusual problem may be surveys drawn from organizations that have been historically overfunded. Many large non-profit organizations such as hospitals or regulated utilities may report M&R costs that exceed those really necessary to meet M&R requirements.

Consider both lifecycle forecasts and survey-based benchmarks. This is a conclusion that follows from the limitations we mentioned above. Both types of information are useful for making cost forecasts and justifying them. Lifecycle cost forecasts are based on the detailed repair requirements of key building components. The lifecycle approach is very flexible, in that it can generate cost forecasts for single components or a large organization—a university campus, a military base, or an entire government agency. It is also very detailed, illustrating the actual oscillating cost of M&R costs over time rather than reducing these trends to a simple average. Lifecycle estimates have a high degree of credibility because they can be reduced to a set of clearly stated assumptions. Surveys, on the other hand, have the strength of reporting actual experience rather than hypothetical estimates, and may capture specific industry nuances not recognized in lifecycle models.

A strong approach to budgeting M&R costs is to recognize both types of estimates. Lifecycle estimates provide a specific forecast of annual costs, while survey results provide a range of actual expenditures for similar facilities. The two approaches need not agree, for reasons of definition (of M&R costs) and perspective (ideal spending versus actual spending) but the comparison usually leads to a better understanding of the underlying sources of M&R costs and makes the final budget forecast more defensible.

M&R forecasts should not rely on facility replacement costs. This recommendation eliminates a small but appreciable error in many cost forecasts. A common way to approximate M&R costs is to multiply the current replacement value times a fixed percentage (usually between 2 and 5 percent) representing M&R requirements. This approach is not a problem for young facilities, but for older facilities it leads to biased (upward) estimates of M&R costs, and the older the facility the greater the error will tend to be.

Consider that the replacement value of a building is typically adjusted for inflation using an index of new construction costs. Thus, M&R forecasts based on replacement value are also adjusted for inflation, *but they are adjusted by the cost of new construction.* M&R costs have a specific inflationary trend over time, and it is less than that for new construction. In fact, considering the Whitestone M&R index for non-residential buildings we find that, over ten years, M&R costs have increased 24 percent while new construction costs increased 30 percent over the same period. The example below shows the error that can result when inflated-adjusted replacement costs are used to estimate the current budget for a 10-year old facility. A better alternative is to simply adjust the initial budget using the appropriate M&R cost index.

Example of Error in M&R Forecasts Based on Inflation-adjusted Replacement Costs.

Consider a 10-year old facility originally built for \$10 million (\$87), with an initial annual M&R budget of \$300,000 (\$10 mil x 3%):

Approximate the M&R budget for 1996:	
Based on replacement value (\$10 mil (x 1.30) x 3%):	\$390,000
Based on original budget adjusted for M&R inflation (\$300,000 x 1.24):	<u>\$372,000</u>
Overestimate using replacement value:	\$18,000