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The Impact of Underfunding Preventative Maintenance on Total Cost of Ownership

November 8, 2016

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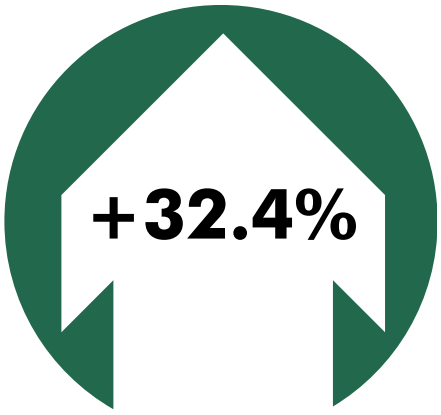
Q: IF I UNDERFUND MY PREVENTATIVE MAINTENANCE BUDGET, AM I REALLY SAVING MONEY?

A: YOU THINK YOU'RE SPENDING LESS, BUT YOU'RE NOT!

Over the 50-year lifespan of an office building:

Underfunding Preventative Maintenance by...

...Leads to Higher Total Cost of Ownership[1]



[1]*Total Cost of Ownership includes Preventative Maintenance, Unscheduled Maintenance, Minor Repairs, and Capital Replacements.*

A Common Facilities Cost Challenge for GWS Clients

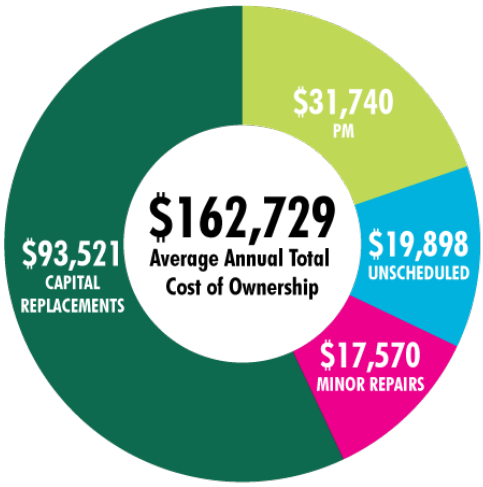
In an environment of limited resources, saving money is a fundamental and constant focus for GWS clients. As such, we often are faced with questions about cost savings opportunities around facilities management and preventative maintenance (PM) programs. In many cases, clients may utilize a "run to fail" approach with very limited, if any, preventative maintenance. The prevailing thought is that a reduction in the PM budget can provide immediate savings. However, the long-term cost of this approach can far outweigh short-term savings. Our latest study may help you answer the question, *"How will underfunding your preventative maintenance program impact your total cost of ownership?"* for your client's specific portfolio.

A Case Study Using CostLab Technology

CBRE | Whitestone used a detailed simulation approach to answer this difficult question. Our analysts compared the total cost of ownership for a 50,000 GSFT office building under two scenarios: a commercial standard maintenance program versus an underfunded PM program over a 50-year period. The enclosed case study details our findings and approach.

Scenario 1

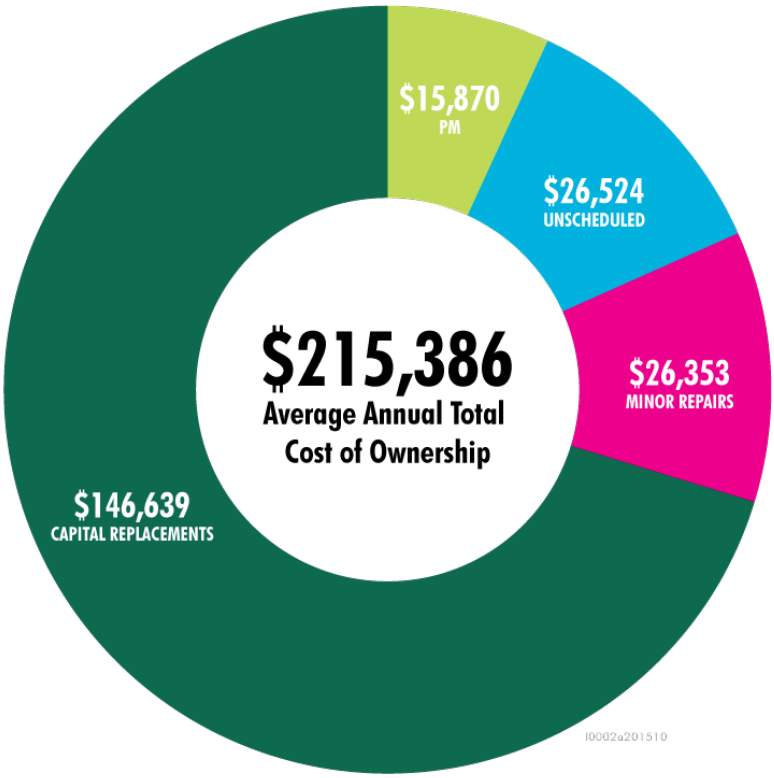
FULLY FUNDED PM



- Typical service calls
- Standard equipment service lives

Scenario 2

UNDERFUNDED PM (50%)



- Increased service calls
- Shortened equipment service lives

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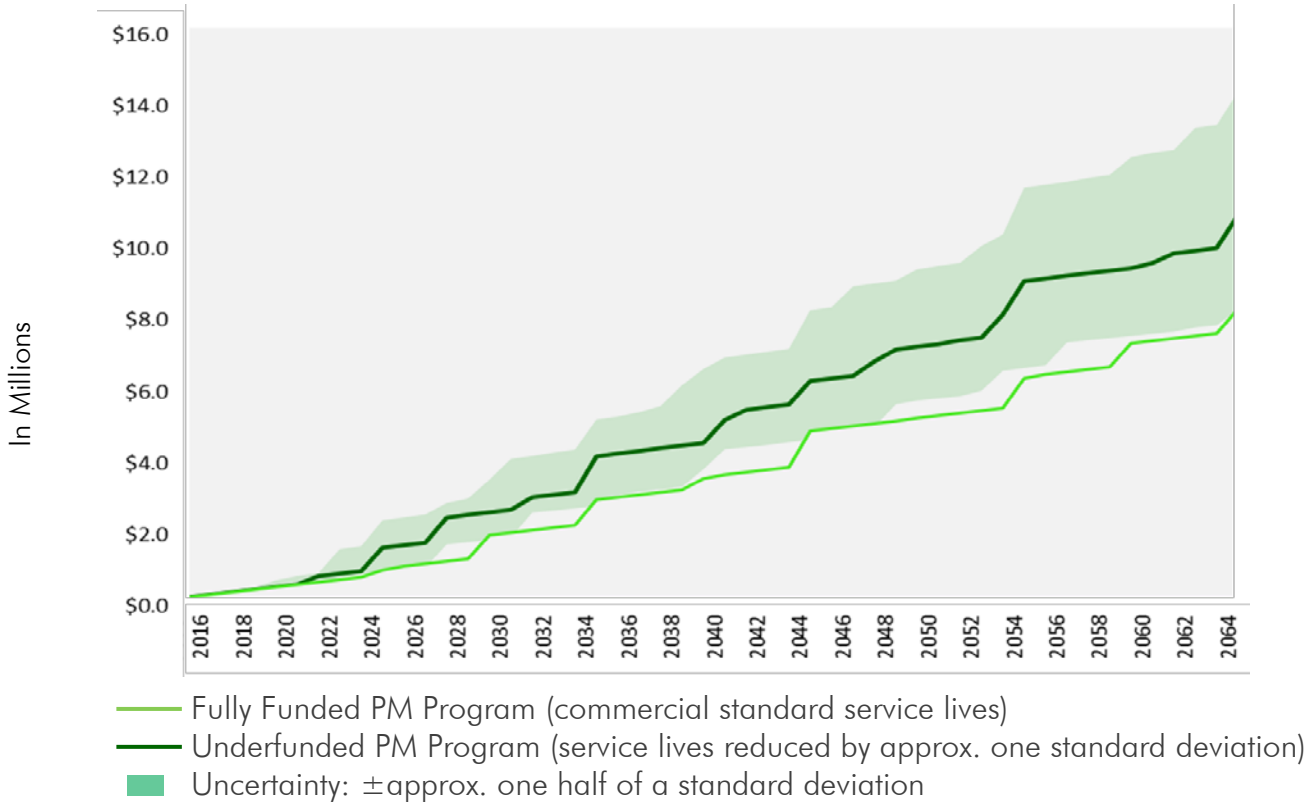
Cumulative Total Cost of Ownership

The higher average annual cost of ownership in Scenario 2 (Underfunded PM) results in approximately $2.6M higher cost than Scenario 1 (Fully Funded PM). We have taken into consideration a range of potential impacts on unscheduled maintenance, service lives, and total cost of ownership in our calculation, as illustrated by the shaded region in the chart below and described in the Methodology section.



Methodology

Our analysts compared the total cost of ownership for an office building under two scenarios: a fully funded PM program, which assumes commercial standard equipment service lives, versus an underfunded PM program that incorporates reduced service lives. The analysis used CostLab, a proprietary online system for facility cost modeling. A detailed component-level cost model (description below) was generated for a 50,000 GSFT office building built in 2015 and located in Dallas, Texas.

Sample Facility:

Use Type:	Office Building
Location:	Dallas, TX
Size:	50,000 Sq Ft
Built Year:	2016
Specs:	70+ Component types

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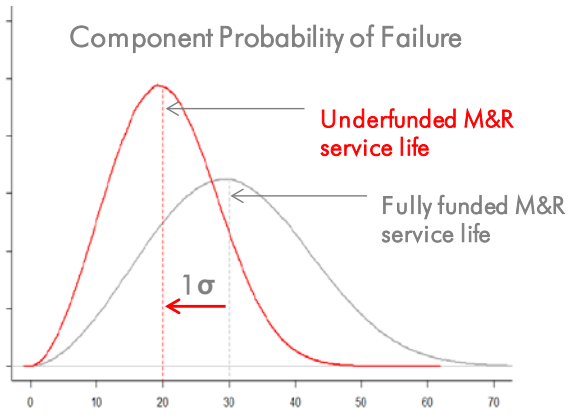
COSTLAB OVERVIEW

CostLab provides the ability to customize facility cost models with specific criteria down to the component level. It relates maintenance tasks from a pre-defined task library to each selected component in a cost model. There are four types of maintenance that make up total cost of ownership—preventative maintenance, unscheduled maintenance, repair, and replacement tasks. Major repair and replacement tasks are categorized as capital requirements. The frequency of each maintenance task and the installation date of the component determine future requirements. Task cost is estimated by associated labor hours and material costs for each task, and the local labor rate and markup for the trade performing each task.

For Scenario 1, the commercial standard maintenance program includes fully funding all preventative maintenance tasks recommended by equipment manufacturers and common industry practices. As a result, we assume typical frequency for services calls (i.e. unscheduled maintenance), and industry mean equipment service lives.

Scenario 2 assumes PM requirements have been underfunded by 50%. Consequently, we assume an increase in unscheduled maintenance, and reduced equipment service lives.



A conclusive mathematical relationship between underfunding PM and the effect on unscheduled maintenance and replacement frequencies is unknown. This case study makes the reasonable assumption that unscheduled maintenance increases and service lives are reduced if equipment is not properly maintained. Scenario 2 shows the cost estimates when service lives are decreased by 1/3 (approximately one standard deviation), and unscheduled maintenance is increased by a similar relationship. Due to the uncertainty about this relationship, our calculations also include a range of potential impacts on unscheduled maintenance, service lives, and total cost of ownership.

Other Considerations

We recognize that the outcome of underfunding PM will vary depending on a variety of circumstances. While we make simplifying assumptions to estimate potential impacts, there are many complexities one may consider, including:

- We make the assumption that PM is reduced evenly for all components. In practice, strategic reduction for less critical components would likely reduce the overall impact on cost.
- Our calculation assumes the underfunding of PM has the same impact on unscheduled maintenance and service lives across all equipment types, although we recognize the impact may vary.
- Estimates represent expected results for an office building in Dallas, TX. Alternate asset types and locations may produce different impacts on total cost of ownership, although we would expect qualitatively similar results.

Key Takeaways

1. Under the constraints of a limited budget or in an effort to achieve savings, facility managers often reduce spend on preventative maintenance. **While the short-term impact on operating costs is apparent, the long-term consequences are often difficult to predict or perhaps ignored**.

2. **This brief analysis predicts that underfunding PM requirements by 50% could lead to an increase in total costs of 32.4% over 50 years, a common useful life for office buildings**. The exact relationships between underfunding PM, unscheduled maintenance, and equipment service lives are unknown, but the calculations presented in this case study are a reasonable approximation of the anticipated results.

3. **Facility managers should use caution when reducing PM budgets**. Portfolios with many short-term leases that exclude capital requirements could see a benefit of cutting operating costs. Owners and long-term occupiers can optimize their bottom line by evaluating operating budget decisions in light of anticipated total cost of ownership.

4. **This analytical methodology can be applied to a large, distributed and diverse portfolio of assets, and can help make the case for additional PM funding.** Please contact us to learn more.

For more Information

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