Optimize Your Facility Investment

by Russ Watson

Applying sound financial planning methodologies is not only crucial for your personal portfolio, but is also essential in facility asset management. When properly implemented, facility asset management can extend facility and building life cycles, lower annual funding requirements, and decrease facility ownership costs.

Buildings are a significant investment for any organization. Many facility investment strategies lack a baseline annualized cost of ownership. By establishing an annual cost of ownership (ACO), you can set a baseline for facility planners to evaluate the cost of investing in a facility's lifespan. Today, facility planners develop funding strategies based on traditional measures such as historical spending factors, subjective condition assessments, and industry trends and drivers. But owners need to adopt commercially available technology tools that provide the same financial planning services for buildings as they do for business planning or personal retirement plans.

Decision support tools are becoming commonplace in the technology toolbox. Decision support technology is based on data-driven calculations and mathematical algorithms that can be reviewed, audited, and improved upon as programs mature. Much like the annual audit by your personal financial planner, decision support systems help building owners and

managers determine financially prudent investment strategies. There are five key formulas that support decision support technology for facility assets:

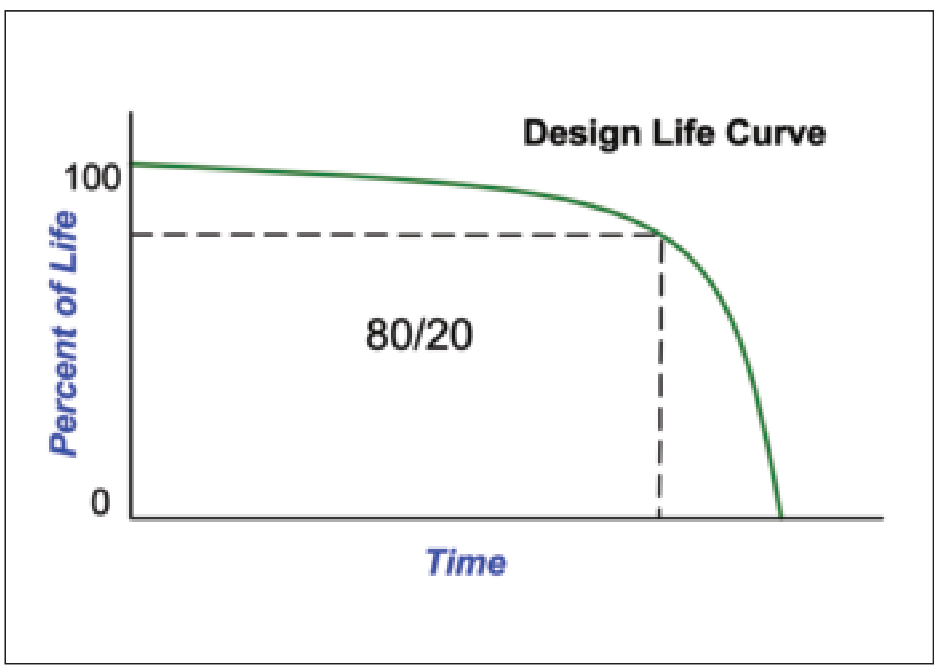
1. Identifying the design life curve
2. Calculating a numeric condition index (CI) rating on auditable objective data
3. Forecasting asset service life based on current condition
4. Applying life-cycle cost analysis and benefit-to-cost ratio analysis
5. Calculating return on investment (ROI) and aligning investment strategy with business objectives

Design Life

Understanding and documenting the intended design life of a given facility system and/or component is crucial to develop a baseline 'as-is' CI. Within a decision support application, each asset is associated with a design life curve derived from recognized industry standards and trade groups such as the U.S. Housing and Urban Development, Means, Whitestone Research, Fannie Mae, American Association of State Highway and Transportation Officials, and Roofing Industry Educational Institute. Most design life curves follow an 80/20 rule where 80 percent of asset failure occurs in the last 20 percent of asset life.

Condition Index

To develop a CI, a visual survey has to be performed on each unique component asset. Condition assessments are based on quantifying



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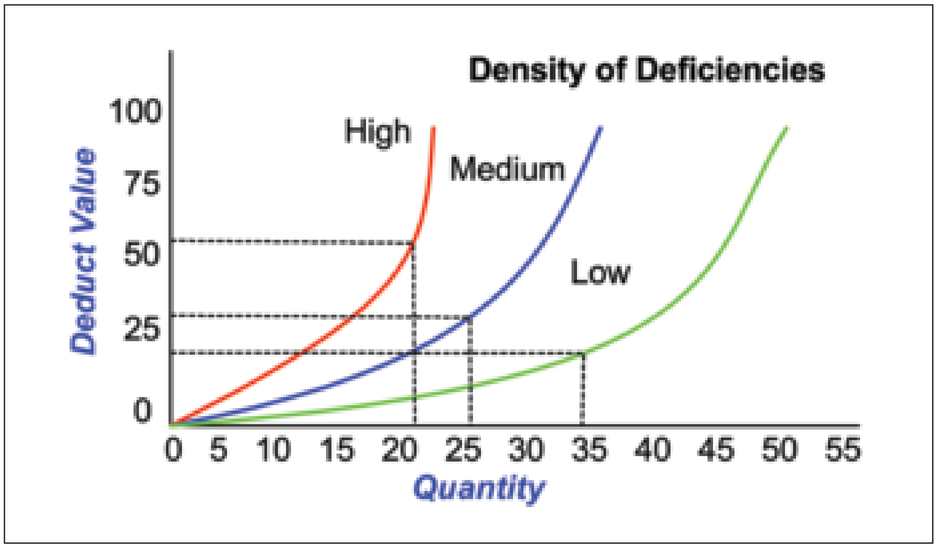


visually identified distresses, and determining the severity of that distress from objective choices. These existing distresses provide a measure of the assets' condition and performance integrity. They also provide an early indication of possible system failures, maintenance and repair requirements, and a basis for scheduling a more comprehensive evaluation, if appropriate. Condition index is based on a scale of 1 to 100, with 100 representing a new, defect-free asset or component. The degree of system component deterioration is a function of:

1. Types of distress.
2. Severity of distress (i.e., size, extent of deterioration, etc.).
3. Amount or density of distress, which can be expressed as a percentage of the total size or value of the inventoried asset.

Each of these distress characteristics is significant in determining the overall amount of physical deterioration. If any of these characteristics are ignored, developing a meaningful CI is not possible. For each system/component there are several different types of visual distresses and possible degrees of severity for each type of distress, and a range of density for each combination. Combining the effects of these three characteristics into a single index requires using computer algorithms that generate numerical deduct values. Deduct values calculated from distress type, severity level, and density are determined and subtracted from 100 to create a Condition Index.

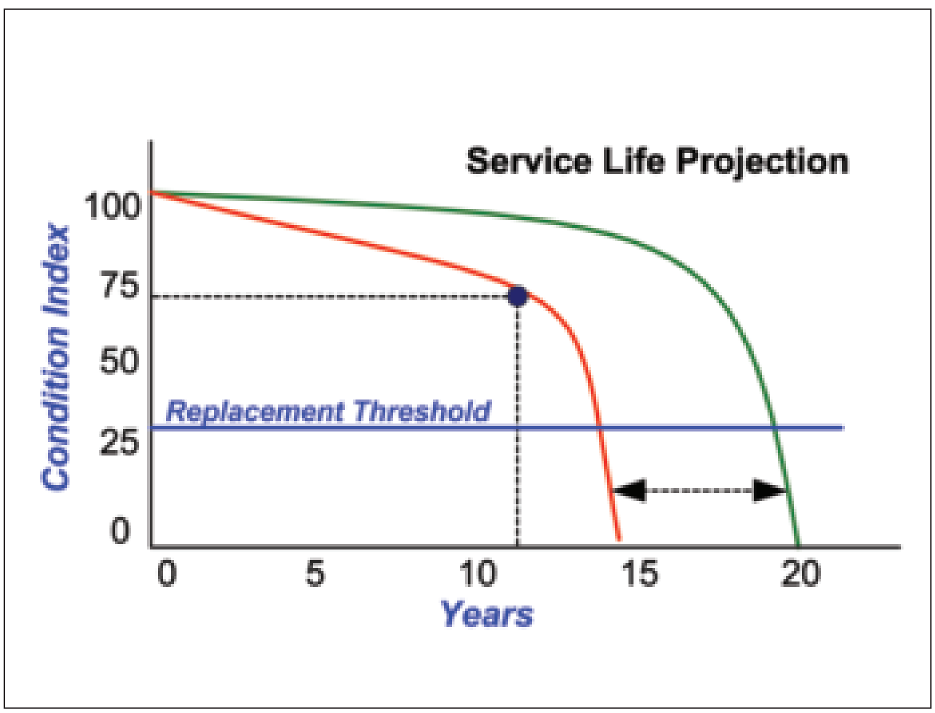
Service Life

Predicting service life is a direct result of the CI. For example, if an asset in year 11 has a CI of 73, then plotting this index against the design life curve will indicate if the asset is "on the curve" or "off the curve." The following graph depicts this scenario with the green line representing the design life and the red line representing the current service life of this asset with a CI of 73 at year 11.

In this example, the asset with a CI of 73 at year 11 is projected to have a useful service life that is five years less than the design life, the anticipated service at the time it was first placed in service.

Our approach follows the functional steps listed below to determine current condition and to project the remaining useful service life of any known asset:

1. Perform objective visual surveys of discrete physical asset components
2. Determine original design life and current replacement value. (What is the investment at risk?)
3. Quantify visual observed defects that are adverse to the life cycle of the asset (create deduct values).
4. Determine the Annual Cost of Ownership (the baseline) by amortizing the replacement value over the design life including cost of capital.
5. Apply deduct values against the life cycle to determine 'as-is' condition-based age.
6. Subtract 'as-is' condition-based age from design life to determine remaining service life.



So, given the 'as-is' condition-based age and remaining life expectancy of an asset, the question becomes, what are the options to extend the life of this asset and are the options cost effective?

Life-Cycle Costs

Return on investment (ROI) analysis is the underlying basis for the decision process. Critical in performing this analysis is converting a facility asset into an annual cost of ownership. To adequately convert facility data into financial terms, you first establish the value of the asset being managed. For example, a roof asset that is 35,000 square feet with a replacement value of $5 per square foot would have a current replacement value (CRV) of $175,000. But what is the value of this roof when it is 12 years old?

Depending on the definition of Capital Depreciation and Expense Allocation, from an accounting standpoint, it is likely that a 12-year-old roof asset has little, if no book value, to the owner. However, every year that the roof is performing represents another 12 months that the owner does not have to purchase a new roof. If there was an opportunity to invest $12,000 in repairs to this roof asset and the $12,000 would buy two more years of serviceability, would the investment generate a positive return on investment? Our approach is to value each year of a facility component's life (in this example a roof) by amortizing the replacement cost combined with an internal cost of capital or bond-rate over the design life of the asset. This calculation, while perhaps not valid from generally accepted accounting principles, is extremely valid when deciding on whether to make an investment in repair.

Given the example above, the $175,000 roof asset amortized over a design life of 20 years at an assumed bond rate of 10 percent represents an annual cost of ownership of $20,555.

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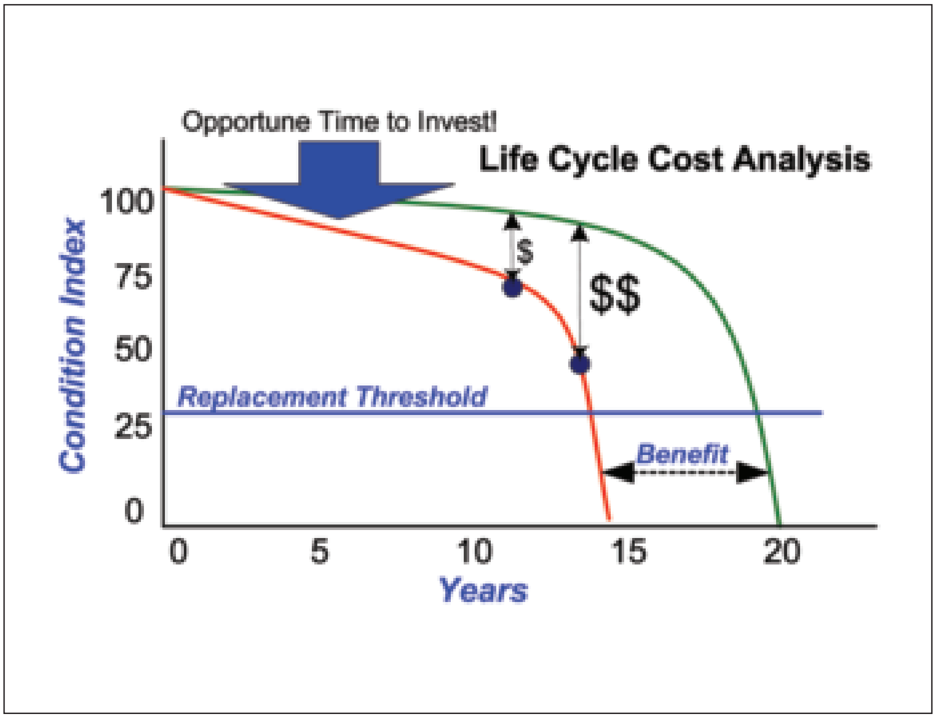

If an investment of $12,000 would 'buy' the owner two additional years of service life, then the owner would benefit by $29,110 in economic value added or a 242 percent return on investment. The following calculation depicts this value:

Conversely, the decision to not invest $12,000 in the strategic repair would be at a cost to the owner of $29,110 in premature failure of roof life.

The net results from this analysis will demonstrate a significant ROI contribution to the owner's facility management success and serve to justify both funding requests and investment decisions to the owner's constituency. The analysis follows seven basic steps:

1. Quantified conditions (deficiencies) drive condition-based age.
2. Model various scenarios of repair to determine the best value received for the available budget (repair or replace).
3. Recalculate the condition-based age with each scenario.
4. Apply the cost to remove defects (because we measured them).
5. Measure the benefit (life extending results) of repairing the asset.
6. Compare the benefits of repair versus replacement versus doing nothing (preventive maintenance only).
7. Optimize the investment required based on the best value.

Return on Investment (ROI)

The 80/20 aspect of a design life curve and understanding that the longer deficiencies go untreated, the greater the gap between design verses performance curve, it is then easy to recognize that the sooner an asset can be repaired, the less the investment cost and the greater the return. Therefore, by identifying the spending strategies with the greatest ROI will allow the owner to achieve the biggest bang for their buck.