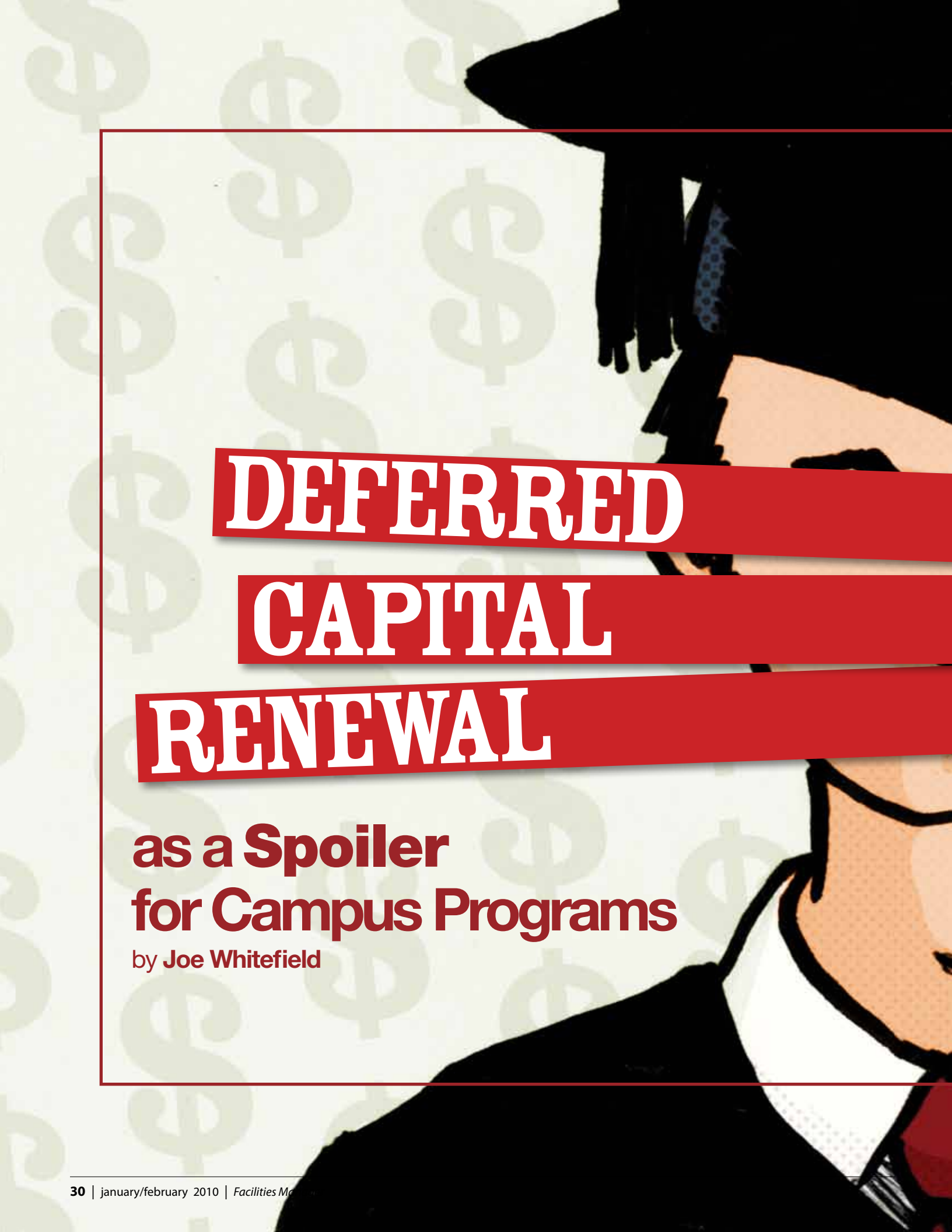

DEFERRED CAPITAL RENEWAL

as a Spoiler for Campus Programs

by **Joe Whitefield**

It happens in practically every sport in every season.

A great team is denied a shot at a championship game or the playoffs because, at a critical time in the season, they are defeated by a lesser team with no championship hopes and nothing to lose — the dreaded *spoiler*. Coming off of their own poor performance, spoilers seek a measure of satisfaction by spoiling the impending success of their opponent. Most, if not all, sports fans can remember a particularly painful loss to a spoiler that cost their favorite team success. In some cases the losses are so significant that teams suffer setbacks that take years and decades (you know who you are) from which to recover.

For facilities managers, deferred capital renewal (DCR) is the issue that, in many ways, can play the role of spoiler for other programs and initiatives are that important to their campuses. In particular, operations and maintenance programs, campus growth strategies, and even sustainability programs can suffer setbacks caused by the unplanned system failures and/or the significant funding required for an adequate capital renewal program.

In looking at the issue of DCR as a spoiler to higher priority programs, the viewpoint of this article intends to be simply an economic look at the challenges and some opportunities present when dealing with this topic. This approach encourages a more integrated view of DCR and its physical and financial relationship with other institution programs and their objectives. Since these programs require funding and other resources, they must be prioritized and various elements traded off in order to be effective.

one action that may prove useful in developing an action plan for CDR is to categorize the facilities/systems according to their value to the campus.

QUANTIFYING DCR AND ITS RISKS

Buildings, their support systems, and their required utility infrastructure all have a useful life. Often, the useful life of a system can be prolonged by an effective operations and maintenance (O&M) program including preventive and/or predictive maintenance activities. Of course the useful life of a system can be shortened in the absence of an effective O&M program. Either way, it is a matter of when a system is no longer adequate and should be replaced – this typically requires capital funding. For this reason, the term "deferred capital renewal" is often more preferred today that "deferred maintenance".

QUANTIFYING DCR

There are different methods for quantifying DCR. One method I favor uses a fairly simple formula for estimating the annual capital renewal ($) of a building, or buildings, and aggregating that figure over a specified time period. Consider the following formula, adapted from "Three Approaches to Setting Recapitalization Rates, *FM Date Monthly*, August 1997:

ACR = 2/3 * CRV * (building age/1275) where,

ACR= Annual Capital Renewal

CRV = Current Replacement Value of the building

1275 = sum of the years digits for a 50-year life of a building

This formula is based on a model of investing two thirds of the current replacement value of a building in capital renewal over a 50-year life of the building. The implication is that capital renewal in excess of two-thirds the replacement value indicates the need to build a new facility. Of course, many campuses have buildings older than 50 years, so some scaling and adjustments to the formula may be reasonable.

To convert this estimate to DCR for a campus, one could:

- Apply the ACR over a period of time (say 20 years) and total the amount
- Include a factor for associated infrastructure if served by central plant utilities (say 25%)
- Deduct Capital Renewal investments over the same period

This would give an overall estimate for DCR fairly quickly by simply evaluating the age and current replacement value of each facility. Keep in mind it is a broad look at the campus intended to provide a sense of scale of the problem.

RISKS OF DCR

Quantifying DCR is one thing, understanding the risks it posses to operations is another. These risks run the gamut from minor system failures and interruptions in service (brief utility outages, roof patches, etc.) to more catastrophic failures that have cascading effects (major outages shutting down events, programs, etc). Generally speaking, the more severe the DCR condition, the more frequent disruptions will occur – usually at higher costs associated with repairs for systems that have been run to failure.

The problems associated with DCR can be sneaky. Checking maintenance records may show chronic problems that are small but constant. Other times DCR can seem somewhat dormant until a rash of larger problems arise—typically at the most inopportune times. On a side note, it is recommended that major risks associated with buildings and utility systems should be identified and included as part of any formal risk assessment program for the campus.

For this discussion, one action that may prove useful in developing an action plan for CDR is to categorize the facilities/systems according to their value to the campus. One example can be taken from an exercise performed by Middle Tennessee

Table 1 —
Overall Building Rating (*)

		Current Condition		
		90-100	80-90	<80
Potential Value	High	A	B	C
	Medium	A	B	C
	Low	D	D	D

Table 2 —
Deferred Capital Renewal for Educational and General Facilities (*)

Overall Building Rating	Square Footage	20-YR Deferred Capital Renewal
A	1,267,353	$19,297,167
B	977,395	$49,955,169
C	297,334	$31,204,298
D	95,614	$5,937,337
Other	67,808	$1,919,804
Infrastructure		$27,078,443
20-YR Capital Renewal/ Capital Maintenance Funding		($23,380,000)
Totals	2,705,504	$112,012,217

(*) Taken from Middle Tennessee State University Campus Master Plan, February 2007

State University. MTSU evaluated several building factors in determining an overall rating for each facility. These building factors include:

- Current Condition (0 – 100 rating scale) - determined by a facility condition survey performed in 2007
- Potential Value (High, Medium, Low rating scale) – a subjective assessment of elements such as land use, academic program suitability, code issues, original campus structure, etc.)

The Current Condition and the Potential Value are combined to produce an overall rating of A, B, C, or D. The overall rating is determined by the following [Table 1]:

Applying the DCR formula stated above to the campus facilities and combining it with the Overall Building Rating produces the following [Table 2].

Overall, the result of this exercise is useful tool for assessing some of the DCR risks, in particular where they may materialize, and for establishing various program priorities, trade-offs, and opportunities.

DCR AS A SPOILER

By now, most facilities managers are familiar with the impacts excessive DCR has on operations and maintenance (O&M). System failures brought on by DCR play havoc with O&M budgets

that are already under pressure. Corrective maintenance is urgent and expensive compared with preventative maintenance. As the frequency of system failures increase more funding is required—at the expense of other priorities. Within the O&M budget, non-maintenance services (cleaning, grounds, etc.) are reduced and/or preventive maintenance type services are reduced which only exacerbates the problem. Funding provided outside the O&M budget is at the expense of other campus programs.

Drawing resources away from other programs and initiatives is the primary way DCR spoils things for an institution. When adequate funding is not available the inevitable system failures will physically impact the programs and events. Either way, the campus suffers in its appearance and functionality by the effects of DCR over time. Again there is considerable understanding on this issue through experience and considerable literature on the subject.

Still, there are two other areas of concern for today's facility manager where DCR has the potential to be a spoiler.

CAMPUS GROWTH

Over the past 10 to 15 years, many campuses have been experiencing significant growth in enrollment, additional facilities, and additional academic and athletic program needs. Much of the time, growth related projects come quickly with insufficient attention to or funding for the increased capital or operational requirements. Examples include:

- New building projects that add to the total inventory requiring O&M services and future capital renewal
- New building projects that add load to utility systems and infrastructure without adequately addressing the increased costs to these systems
- New building projects that don't fully address the renovation needs of the existing facilities involved in the tenant and program shuffling that comes with new space
- Increased enrollment increases the load on existing facilities accelerating the effects of DCR
- New programs and equipment occupy spaces not fully equipped with the utilities to meet their requirements

In these cases, growth impacts DCR by 1) simply adding to the facility stock requiring capital renewal, 2) leaving a portion of the total capital cost to be covered in the future by a capital maintenance budget, or 3) adding to the O&M burden in such a way as to siphon funds away from other maintenance priorities.

The counter to these problems is to identify these areas of concern and address them in the planning and budgeting sessions. It typically makes great economic sense to address several DCR items as part of most new construction projects. Motivation to address outstanding capital renewal needs may be uniquely present along with potential economies of scale. This disciplined process requires assessing the full impacts of growth and evaluating the benefits of addressing the problems up front – even if something else has to be traded-off.

Failing to adequately plan and budget for the additional O&M and capital needs brought on by growth will only add to the economic burden of the campus. Over time, this type of burden can cripple any organization. In fact, author Jim Collins, in 2009's *How the Mighty Fall*, cites the "undisciplined pursuit of more" as one of the five stages of decline for companies and organizations that ultimately fail. Incidentally, another stage in this decline is the "denial of risk and peril." This sounds a lot like DCR and its risks associated with campus growth.

SUSTAINABILITY

Many campus sustainability programs are currently in some form of development. These programs are considering initiatives to improve efficiency in existing buildings, design and construct new facilities to operate efficiently, reduce carbon and greenhouse gas footprints, educate constituents, comply with regulations of some type, etc. Once again, DCR can act somewhat as a spoiler these initiatives if not properly addressed.

Failing to adequately plan and budget for the additional O&M and capital needs brought on by growth will only add to the economic burden of the campus.

Most of these programs involve addressing the energy efficiency of existing facilities. To that end, there are many opportunities for reducing energy consumption through retrofit projects. Similar to new projects, it is tempting to limit the project scope in ways that leave the costly system replacements for some time (or someone else) in the future. This approach may diminish the anticipated energy results.

It would be desirable for sustainability initiatives to help address wider capital renewal needs. In many cases, sustainability projects have an opportunity to do so. It often becomes a matter of the economic performance of the project if paybacks are required or initial investments are limited. Also, certain measures such as lighting retrofits have favorable economics allowing for additional measures to be bundled.

In addition, there are some unique economic considerations for other elements of a sustainability program. One is the overriding decision to make-or-buy energy benefits. Consider the following options::

- Reduce energy consumption through retrofit projects (demand-side)
- Purchase green energy or environmental credits through

the utility provider or a marketer (supply-side)
- Install renewable generation on campus (supply-side)

Each of these options should be compared with one another evaluating total investments, operating costs, and paybacks. Each scenarios presents a different set of challenges and opportunities when considering DCR.

SUMMARY

Deferred capital renewal is a condition for most campuses that has proven to be a spoiler for many other programs and initiatives. It posses physical risks in terms of continuity of operations as well as well considerable fiscal risks to both operating and capital budgets. Accounting for these risks and developing funding and operational strategies to stay somewhat current on capital renewal needs while gaining some ground on the DCR are important steps for institutions. At the same time, it is also important to account for DCR implications as part of a campus growth strategy or a sustainability strategy. Some recommended steps in this process include:

- Adopt an economist view of the DCR condition – consider its risks to other programs, prioritize objectives, think "trade-offs" instead of "solutions"
- Quantify DCR in order to develop a sense of scale
- Categorize DCR along with other facility and physical plant elements to assist in assessing risk factors and setting DCR priorities and funding strategies
- Seek to address DCR needs with other campus programs such as O&M, campus growth programs, and sustainability initiatives
- Seek to address other campus program needs with a capital renewal program
- Recognize that DCR, campus growth programs, and sustainability programs each require large investments of capital funding. Through planning and budgeting, each program has some opportunity to support the other – to a point. After that, they become programs competing with each other for the limited funds and resources.

In short, spoilers are successful because of a lack of preparation in dealing with them. DCR is not much different. Lack of funding is one thing, lack of consideration is another. Don't let DCR negatively affect the other important campus programs by looking past its risks and simply hoping it remains dormant.

Joe Whitefield is executive director of facilities services at Middle Tennessee State University, Murfreesboro, TN. He can be reached at *jwhitefi@mtsu.edu*.