

# What is Current Replacement Value and Why Should You Care?



*by Theodore J. Weidner, Ph.D., P.E., AIA*

In the search for metrics to compare campuses for operational efficiency, physical condition, and other factors of importance, chief financial and facility officers have developed ratios based on the current replacement value (CRV) of the constructed vertical (buildings) and horizontal (roads, utilities, and grounds) infrastructure of a campus. CRV is an essential element of the facility condition index (FCI), the needs index (NI),<sup>1</sup> and other measures of institutional commitment to facilities.<sup>2</sup> CRV is an element in annual reports describing campus assets and can also be used to predict costs of future expansion of the campus for fund-raising efforts or for academic and financial planning. Getting the CRV wrong means that the FCI and other ratios will be wrong, plans will not be tied well to budgets, and your credibility with faculty, trustees, or executives will drop. Getting the CRV right improves your chances to get the next new project or campus rehabilitation approved.

Current replacement value is defined as “the actual cost of replacing the facilities...not the book value”<sup>3</sup> and “the total expenditure in current dollars required to replace a facility...[to] meet current acceptable standards of construction

and comply with regulatory requirements.”<sup>4</sup> Despite that clarity, knowledgeable people provide varying responses often in conflict with the above definitions; the chief financial officer may provide a book value while the chief facilities officer may answer differently. Defining CRV seems to have more to do with what makes sense to the facilities and financial officers, making the campus more or less valuable depending on their interest or organizational needs.

However, given that the physical infrastructure of a campus likely has greater replacement value than the endowment<sup>5</sup> (which has fairly clear rules and definitions for valuation), it seems irresponsible to have a relaxed attitude about the definition of the current replacement value of campus facilities. Too often the importance of a consistent CRV is diminished; it changes every year because construction costs change. Consistency is important for benchmarking. This article presents the rationale supporting a consistent definition of and methods to determine an appropriate current replacement value. It looks at standard real estate valuation techniques, national data sources, and common errors. Lastly, some practical techniques and examples are included.

## **Consistency**

Both definitions of CRV provided above focus on replacing a facility as currently used. A building constructed for \$100/gsf (inflation adjusted) may be used in a way where it cannot be replaced for less than \$200/gsf. The definitions say

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**Ted Weidner is president of Facility Asset Consulting, Amherst, Massachusetts. He can be reached at [ted@weidnerfac.com](mailto:ted@weidnerfac.com).**

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the facility is valued at \$200/gsf; the cost to replace it. In another case, older buildings that have been grandfathered by the building code (they met the building code when constructed but now don't meet the current code) can only be replaced if they meet the newer, more stringent code requirements. Since they can't be replaced with a non-code compliant building, they should be valued as if they were code compliant. Thus, a multi-story building without an elevator should be valued as if it has one or more elevators (depending on the code or needs). However, a campus that has made the commitment to increase faculty office sizes from 100 sf to 150 sf should not increase the value of its facilities for that reason.<sup>6</sup> These are examples where CFOs (both financial and facilities) may incorrectly estimate CRV. This concept may be a big leap but it is important to accept.

Knowing how the building is used and what it would cost to replace can be a mechanical exercise with varying levels of complexity and accuracy. Normalized values, cost per gross square foot, are used to facilitate the calculations. But how is the correct normalized value determined?

## Real Estate Appraisal

Real estate appraisers use three methods to arrive at the value of a facility and/or the land it is situated on. These methods are called the income, comparable, and cost approaches.

Most real estate is valued for commercial (and tax) purposes and therefore the value is partly based on the income it can derive. Because most universities are nonprofit entities, an excuse can be made to avoid taking the first approach (income method) to value campus facilities. (Note: The income approach may be considered, but it requires analysis of the income from instruction and research that are too controversial to be handled here. See articles by Jacquin<sup>7</sup> and Winston.<sup>8</sup>) This discussion will ignore the income approach and focus on the comparable and cost methods.

To determine the value of a campus building through the comparable method, one would identify similar facilities that have changed ownership recently. This is usually done by investigating real estate transactions in county offices or in business publications. Adjustments are made for differences in size, physical features, amenities, etc., and a valuation is

set. The three most important factors in the comparable approach are "location, location, location." This works two ways when valuing higher education facilities.

Colleges and universities have a fundamental challenge in that they are usually tied to a given site or campus. Your campus brochure probably mentions how the campus is located in the beautiful town of X and emphasizes proximity to cultural and recreational activities; in large cities the emphasis may be on access to the campus for after-work degree programs and other continuing education opportunities. However, real estate transactions involving a building similar to a college building (classrooms, laboratories, etc.) are rare. More generic buildings may have comparable value when appropriate adjustments are made for renovation of the building to college purposes but such examples involve the cost method (which is explained below). Land transactions are more typical, but even here they may be driven by the college and result in distorted comparisons.<sup>9</sup>

Having omitted the income and comparable approaches, the cost approach becomes the remaining method of valuing higher education facilities. This method focuses on the cost to construct the facility as the basis for valuation.

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Appraisers utilize one of the major cost estimating books, Means<sup>10</sup> or Whitestone,<sup>11</sup> that provide examples and construction costs per square foot or they may consult a building contractor.

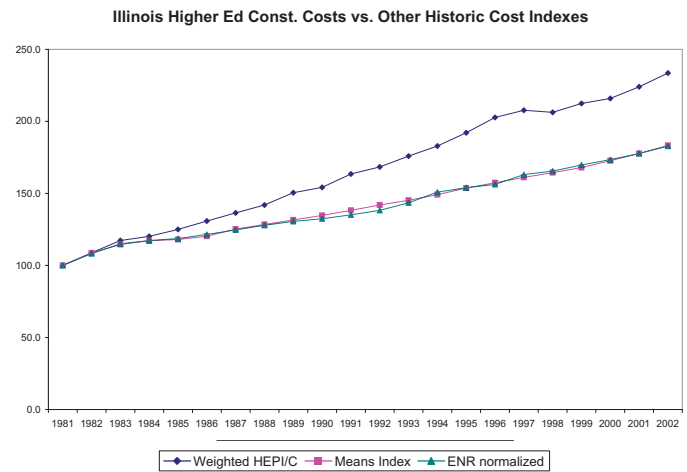
In the cost approach method, details about the building are needed, such as building area, general construction, use, and any important features. Square foot cost estimating methods approximate the value but are not robust enough to address either unique characteristics or customizations that a university may demand<sup>12</sup> or to recognize the added cost for architecturally significant buildings that often find homes on college campuses; the Peter B. Lewis Building designed by Frank Gehry and located at Case Western Reserve University is a recent example.

A modified cost approach is to inflate the original building cost by historic cost indices; however this alternative has flaws. There will be changes in construction techniques and building code requirements (discussed above). Building codes are updated on a three-year cycle and invariably incorporate new safety measures that add to the cost. Fire sprinklers in dormitories may have been optional ten years ago, no more. Twenty years ago, a building might have been constructed without any Internet infrastructure. Forty years ago the building might not have included smoke or fire detectors, only pull stations. It might be argued that it is not appropriate to compare 40-year-old building requirements with current building requirements. But the counter-argument is that professors don't teach in buildings the way they did 40 years ago; they teach in a way that students will learn and become engaged today.<sup>13</sup>

The building valuation must respond to the changing needs for the activities housed within. Figure 1 shows how the Illinois Board of Higher Education has inflated college construction costs over 20 years as compared to other construction cost indexes; apparent college costs have increased by 1.3 percent over the construction indexes. Most members of the college community would be unwilling to work in a building that limited them to 40-year-old building technology and comfort. In reality, facility officers are regularly incorporating new building features. While President James A. Garfield once referred fondly to a well-known professor at Williams College as "The ideal college is Mark Hopkins on one end of a log and a student on the other."<sup>14</sup> Colleges don't look like that today even if the climate would allow it. Most colleges today are acting on the comments of Walter Broadnax, president of Clark Atlanta University who said in a PBS interview "Our dormitories and our classrooms and our instruction has [sic] be to as good as anybody else's, because today's youngsters aren't going to accept anything but the best."<sup>15</sup>

Can a campus keep up with a reasonable estimate of its CRV when the bar is constantly being raised in terms of technical systems, educational methods, and student expectations? Yes. It may require some effort but the tools and

**Figure 1**



information are available. Let's look at the minimum amount of information required and add complexity as appropriate.

### Square Foot Estimating

First, know the size of the campus area in gross square feet of buildings. Use the Means or Whitestone square foot cost data to estimate the value of individual buildings or the entire campus using the general descriptions of buildings and cost ranges; the horizontal infrastructure (sidewalks, parking, and utility distribution) can be estimated at 25 percent of the building value (institutions with little campus-owned infrastructure should reduce this number accordingly). Use the historic cost indexes to make short-term inflationary adjustments. Remember that while the historic cost indexes may cover 50 years or more, building designs have changed so much that pure inflationary adjustments are not appropriate. Campus records of recent new construction costs provide a better resource.

Another approach used for public institutions in Illinois is to have data on net assignable building area (nasf) by 14 different space types. Use the state-supplied construction costs for each space type; there may be some inaccuracies but the advantage is its consistency and state-wide application.

Greater accuracy through the accumulation of building components, quantities, and corresponding installation costs do not add much value. It would be better to maintain costs of campus construction projects and compare normalized data against the national databases to determine what your campus "quality factor" may be. Be sure to include architect and engineering fees and other related construction expenditures since these are part of any building project.

### Summary

Detailed cost estimates, similar to what would be performed as part of a new construction project, may not be necessary to determine CRV. Square-foot based cost estimates can provide reasonable accuracy as long as they focus on current replacement and not replacement of a facility that is no longer current.

Real estate appraisers use three methods to arrive at the value of a facility and/or the land it is situated on. These methods are called the income, comparable, and cost approaches.

### Example 1

A typical campus building is used to illustrate how to determine the current replacement value of a single building or entire campus.

An example building is a three-story, 113,000 gsf (57,684 nasf), classroom building constructed in 1959 for \$2,916,000.

Building cost by type comes from *The Whitestone Building Maintenance and Repair Cost Reference 2003* adjusted for Springfield, Illinois—College classroom \$109.54/gsf.

$$\text{CRV} = \text{gsf} \times \text{cost/gsf}$$

$$\text{CRV} = 113,000 \times \$109.54$$

$$\text{CRV} = \$12,378,020 \text{ (plus factor for horizontal infrastructure)}$$

A clear understanding of the composition of a generic classroom building is essential to make the appropriate adjustments for quality of materials and different components but this is a good start.

Just as the chief financial officer must know the value of the endowment, so too the chief facility officer must know the current replacement value of the campus along with other data that describe the campus condition. Consistent measurement of both the financial endowment and physical infrastructure is essential to present the campus administration as a responsible manager of all resources. Reasonably accurate representations of facility value are easy and can be done with data and materials that most facility officers have at hand. Consistent measures across institutions demonstrate to internal and external constituencies the cost of higher education and the corresponding value of the investment. 🏛️

### Footnotes

1. Cain, David A. and Maggie Kinnaman, "The Needs Index: A New and Improved FCI", *Facilities Manager*, March/April 2004.
2. APPA: The Association of Higher Education Facilities Officers. *The Strategic Assessment Model*. Alexandria, Virginia: APPA 1999 & 2001.

### Example 2

The Illinois Board of Higher Education (IBHE) provides costs by net assignable square feet (nasf) for different use types of buildings (a grossing factor, gsf/nasf, is used to estimate gross area). The data for this building result in:

	nasf	gsf/nasf Factors	gsf	Cost/gsf	Total Cost
Classrooms	26,046	1.5	39,069	\$176.24 =	\$ 6,885,520
Laboratories	3,016	1.67	5,036	\$197.43 =	994,400
Offices	28,185	1.7	47,914	\$182.44 =	8,741,521
General Spaces	437	1.9	830	\$210.66 =	174,907
					\$16,796,348

In the last example, if the IBHE costs are accurate for the campus, then the campus can also develop a quality factor to use against the costs shown in the Means or Whitestone publications. Comparing the two examples, the apparent quality factor is:

$$\text{Campus quality factor} = \$16,796,352 / \$12,378,020 = 1.36$$

This factor can be applied to other campus facilities to adjust for differences.