An Executive Summary

BUILDINGS...

The Gifts That Keep on Taking

A Framework for
Integrated Decision-Making

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Buildings…The Gifts That Keep on Taking:
A Framework for Integrated Decision-Making

Research from

CFaR | Center for Facilities Research

Published by:
APPA
1643 Prince Street
Alexandria, Virginia 22314-2818
www.appa.org

Executive Summary written for APPA by Rodney Rose of STRATUS, a division of Heery International

Printed in the United States of America.
ISBN: 1-890956-37-6

Buildings…The Gifts That Keep on Taking

A Framework for Integrated Decision-Making

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This report is a summary of the findings of a three-year project sponsored by APPA's Center for Facilities Research (CFaR). The purpose of the research was to collect and consolidate what are generally believed to be best practices for facilities planning and management—including common terms, definitions, and metrics—and translate them into a manageable, easily understood and articulated set of factors to be taken into account when making decisions about investing in educational facilities. These factors are intended to provide administrators and/or facility managers with an effective and useful decision framework for evaluating facilities investment alternatives that can support their institution's mission and help achieve its long-term goals.

philanthropist agrees to provide $15 million toward the cost of a new $50 million building for a public university's law school. The institution must still raise the balance, as well as the costs of ongoing maintenance, operations, and capital renewal—hopefully with some commitment of state funds. At another university, students vote in favor of a $10 per semester increase in fees for a new state-of-the-art, $35 million recreation center. It will have two Olympic-sized indoor pools and jacuzzis, a climbing wall, fitness center, running track, basketball and racquetball courts, as well as videogame and meeting rooms and a small café. However, those same students will not have to pay the additional fees they approved and will have long since graduated before the facility is completed. The additional fees will be added to the tuition of future generations of students. The institution and its student government association will also assume the ongoing responsibility for the costs of operations and maintenance.

These examples represent business as usual for higher education institutions. With some exceptions—such as revenue-generating facilities like residence halls or parking structures that are often built with debt financing structures which require

a reserve for major maintenance over the term of a loan—colleges and universities struggle to provide adequate funds for these costs, which can easily exceed three times the cost of initial design and construction.

Higher education institutions spend about $20 billion annually on facilities operations—including maintenance, energy, and utilities—and from $15 billion to $18 billion annually for the construction of new facilities and/or the renovation of existing buildings. College and university campuses provide more than five billion square feet of floor space in 240,000 buildings, which have a current replacement value (CRV) that is estimated at more than $700 billion, excluding utilities infrastructure, roads, and landscaping. In addition, there is a backlog in deferred maintenance estimated at more than $36 billion, or 5 percent of CRV. [The previous numbers are extrapolated from a 1995 APPA/NACUBO/Sallie Mae study.]

For most colleges and universities, facilities are not just about providing a place to house programs and services. The physical campus is a large part of the fundamental nature of the institution, embedded in its image for faculty, students, and alumni, and also for the communities and region in which they are located.

Yet, decision-makers at all levels—chief executive officers, boards of trustees or regents, legislators, and facility asset managers—are increasingly concerned about their inability to control both the initial and long-term costs of campus facilities. These concerns are exacerbated by inadequate funding for maintenance, deterioration of the basic facilities infrastructure, and the increasing demands of technology. Much of this is driven by an increase in the number of older buildings, and the significant costs of capital renewal—the need to replace major facility components based on the life cycle of buildings and their subsystems.

Facilities portfolio managers and institutional decision-makers require a comprehensive asset investment strategy—a set of integrated decisions that take into account the need and priority for construction and renovation, the total costs of ownership, and the impacts of alternative investment choices on the basic institutional mission and objectives.

However, for most institutional and governmental environments, integrated decision-making is not the norm. What is more typical is that basic funding for operations and capital budgets is distinct and usually separate, including organizational responsibility and staffing. Capital and maintenance projects are determined on the basis of priority lists, developed by various means, with the criteria for those priorities not always clear. Maintenance and operations costs are often calculated on the basis of formulae applied across all facilities, regardless of type or use; and funds are often insufficient to meet industry standards. In colleges and universities, in particular, many facilities are custom-designed or "built to suit" for specialized uses, determined by current users or stakeholders that may or may not have a perspective on long-term, future needs. This tends to minimize rather than optimize long-term flexibility in the use and function of spaces.

Design and construction costs are considered one-time capital investment costs and typically require funds from sources that are separate from those that fund operating budgets. Maintenance and operations of facilities are usually financed from the same general fund sources that support ongoing institutional operations—such as

faculty salaries, departmental operating expenses, and libraries—and do not include the costs of capital renewal, major repairs, and replacement of systems. Costs related to ongoing space management, facilities planning, or other planning activities are usually considered institutional overhead and unrelated to the costs of maintaining and operating facilities.

There is a need for easily understood terminology, consistency in the use of data, and clearly defined methodologies for evaluating costs, budgeting for key cost elements, and providing financial oversight for all facets of facility planning and management. Because various cost elements are financed or budgeted across a wide range of categories—or sometimes not at all— it is often difficult to understand the full impact of building, leasing, and maintaining facilities of varying types. Moreover, the resources necessary for the development, operation, maintenance, and renewal of facilities are generally inadequate.

There has never been a comprehensive tool or set of common factors that have been adopted by boards of trustees or regents, institutional executives, administrators, or other policy-makers that enables them to fully understand or consider the implications of their investment choices in facilities over time. Instead, decisions about investing in facilities—including the scope and types of facilities to be built; alternative strategies for design and construction; the total costs of building, owning, and maintaining buildings; and the ability to secure necessary financing or resources—are often made sequentially and independently, and without data that is sufficient, consistent, or timely.

The decisions that must be made in order to determine needs, priorities, and the extent of the investment required for facilities and major equipment are not unique to college and university campuses. The same decision-making criteria are applicable to any organization that is responsible for significant facilities portfolios, including federal and state agencies, school districts, and many corporations as well.

This executive summary and the forthcoming book, *Buildings... The Gifts That Keep on Taking: A Framework for Integrated Decision-Making*, reflect the findings of a three-year project sponsored by APPA's Center for Facilities Research (CFaR). The purpose of the research was to collect and consolidate what

Expected Impacts

- **Integrated planning** for those resources needed for both capital development and renewal/maintenance
- **Improved collaboration** on facilities among institutional policy-makers
- **Change in the paradigm** of decision-making and stewardship
- **Validation** of the critical importance **of information and data regarding facilities**

Research Results

Common Language:
An improved common language for business and facility officers
Linked Funding:
A way to link capital and operating funds into one total need
Sustainability:
A more "sustainable" way for funding of facilities/ infrastructure
Integrated Needs:
Better accommodation of academic-driven and institutional facility upgrades
Mission Critical:
Prioritization methods of the facility needs to institutional mission

are generally believed to be best practices for facilities planning and management—including common terms, definitions, and metrics—and translate them into a manageable, easily understood and articulated set of factors to be taken into account when making decisions about investing in facilities. These factors were reviewed and tested with representatives of higher education institutions and government agencies—senior staff, executive and financial officers, members of governing boards, and facility directors and managers—to determine if they provided an effective and useful decision framework for evaluating facilities investment alternatives that can support their institution's mission and help achieve its long-term goals.

There are many examples of effective analytical approaches, models, or methodologies used by colleges or universities, multi-campus higher education systems, federal agencies, and private firms and corporations to bring more clarity to the decision-making process. While the challenges of planning, designing, and managing facilities are similar, these entities operate in very different organizational, regulatory, and physical environments that significantly influence the nature and scope of facilities and the decisions that govern them. Thus, *it is* not *the intent of this research to develop or define a new "universal model" that could be used for the oversight of any institution or facilities portfolio*. Rather, it is hoped that the findings and recommendations offered here will raise the profile or visibility of these methodologies so that more institutions or agencies will seek out these "best practices" and utilize them in their respective organizations to improve the decision-making process for investing in facilities.

THE STRATEGIC INVESTMENT PYRAMID

The primary focus of this research has been to help institutional executives and facilities professionals work together to establish and maintain an organizational, financial, and cultural environment in which integrated decision-making about facilities *is the norm* and an environment of stewardship is the *goal*. These are the elements that should drive a clear and effective asset investment strategy.

Strategic Questions

First, there are the basic *strategic questions* that all decision-makers ask before initiating any facilities investment. While there are a certainly a multitude of such questions, five of them are the most critical:

1. ***Why should we invest?***
2. ***What can we afford?***
3. ***Where should we invest?***
4. ***When should we invest?***
5. ***How much should we invest?***

Every asset investment strategy should address each of these questions.

"Why should we invest?" seems like a question for which the answer(s) are so obvious that little or no data or analysis is required. While the question goes to the heart of the relationship of facilities to the basic institutional mission or program focus; its real value is in the development of a sound rationale for a given facilities investment will facilitate acquisition of necessary funding, financing, or approval. Such a rationale requires analysis of reasonable alternatives to the proposed investment that will yield similar outcomes or results.

The second basic question, "What can we afford?" also seems obvious. Typically,

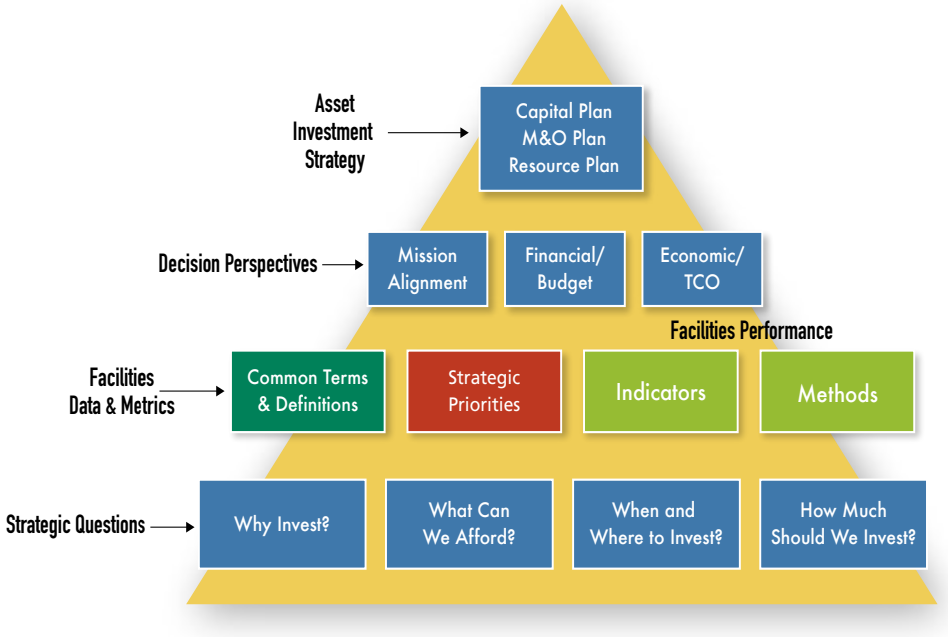
institutional executives or business officers will answer this question within the framework of traditional funding sources or financing used for various categories of capital investments. But this question must also be about *desired building standards*; that is, "What do we *want* to afford?"

For example, an institution may choose to build all or most of their facilities to last 75 to 100 years, with customized construction, materials, and design criteria intended to respond to specific program needs or demands, and/or to maintain a uniformly consistent architectural theme throughout the campus. If every facility on the campus is designed to meet this standard, both initial and long-term costs are likely to be much greater than for a building designed with standard materials and systems, and more adaptable space utilization over time.

The questions, **"Where and when should we invest?"** are focused on the expected *performance* of facilities and systems and their priority compared to other capital or maintenance needs. *Performance* refers to the ability of a given facility or subsystem to be functional or suitable for its intended purpose over time. Other things being equal, is it more urgent or important to replace a roof or modernize a laboratory?

Broken pipes or chiller systems that become inoperable clearly must be repaired promptly, particularly if they support vital research that relies on certain environmental controls. But, depending on the available sources of funds, this could also mean deferring a project to save energy or utility costs over a longer period of time. The same source of funds may also be earmarked to prepare a nanotechnology research laboratory for a highly recruited new faculty member, adding significantly to the dilemma of competing priorities. There are nearly always choices to be made between needs that appear to be urgent and those that may be tradeoffs among various categories of "needs."

STRATEGIC INVESTMENT PYRAMID



INTEGRATED DECISION FRAMEWORK

Finally, the basic question, **"How much should we invest?"** requires a full understanding of all of the cost implications of any facilities investment. For example, the costs of upgrading an electrical or mechanical system involve not only the construction or installation costs of the new system, but the costs of removing the old equipment and the costs of disrupting ongoing programs that might have to be relocated or shut down for a period of time during the renovation. Added to these costs are ongoing maintenance, energy, utilities, or other relevant costs over time that should be compared to other options, assuming they are available, for solving the basic system problem.

Together, these basic questions form the foundation elements of a Strategic Investment Pyramid, a conceptual framework that supports and enhances integrated decision-making regarding any facilities investment. "Integrated" means decision-making that takes into consideration the operational, programmatic, long- and short-term influences and impacts of each prospective investment.

Facilities Data and Metrics

A major challenge for the research team and its advisors was to synthesize the vast amount of data available to facilities professionals and collected in a wide variety of management information systems. It was also a challenge to identify the most essential information needed by decision-makers for choosing among alternative facilities investments. The second layer of the Strategic Investment Pyramid identifies the four critical information or data sets that were determined through the research process to be the most relevant or useful for both institutional leaders and facility professionals in addressing the strategic questions.

In exploring the use of existing models, it is evident that extensive time and effort was required to define and explain basic terminology related to facilities management at the outset—before any progress on developing a budgeting or planning model could occur. The language of the design and construction industry is highly technical, complex, and often confusing even to those in the profession of facilities planning and management. What, for example, is the difference between "rentable square feet"—a term used throughout the commercial market to describe the amount of space occupied by a tenant—and "assignable square feet"—a term used almost exclusively in educational facilities to account for the usable space occupied by a specific program or department? What is the difference between a construction cost estimate and a project cost estimate? How is "current replacement cost" determined, and what is its value? These are all important questions, but to what extent do the answers drive critical decisions about facility investments?

Common Terms and Definitions

As a result, a subgroup of the research team assembled a taxonomy of common terms and definitions that are considered to be most useful to facilities investment decisions in the higher education environment. This list is included in the forthcoming publication and is available upon request. It is not an exhaustive list of facilities-related terms and definitions; those would consume their own impressive volume. Rather, this lexicon is solely focused on information needed for facilities investment decisions. The important benefit of this section is recognition of the need for clarity in all discussions relevant to any asset investment strategy.

Strategic Priorities

Experience suggests that priorities for facilities expenditures are either determined by executive judgment, or delegated to facilities professionals based on whatever criteria govern the resources they control. For example, strategic facilities investments like major new construction or renovation, or leasing off-campus space—are often driven by subjective criteria such as a new funding opportunity or gift, the needs of a department to accommodate new teaching or research programs, or unmet needs that have reached a state of urgency. Sorting these out usually involves high-level discussions among deans, department heads, provosts, business officers, and presidents.

On the other hand, the usually long list of facilities improvements such as replacing electrical, mechanical or plumbing systems, improving the landscape in front of Memorial Hall, or installing a new air conditioning system is left to facilities professionals to set priorities based on management oversight and inspection activities that are part of their responsibilities. In both cases, however, administrators are faced with an annual "wish list" in some priority order. The list is always much longer than the available resources.

Yet, some universities and federal agencies have developed relatively simple, but more objective, decision tools for determining facilities priorities. These are used not to replace but to complement the judgment of agency or institutional leaders. Each of these methods directly aligns facility priorities with institutional mission or programmatic criticality.

The uses of indexes such as the U.S. Coast Guard's Mission Dependency Index (MDI), the Department of Interior's Asset Priority Index (API), and Brigham Young University's system-based priority approach are described in the forthcoming publication.

Objective priority-setting methods used in concert with the judgment of executives with a wide perspective on institutional goals and objectives will result in better decisions about the priority of facilities investments.

FACILITIES PERFORMANCE DATA

Information on the existing performance or condition of facilities is essential for understanding the impacts of various expenditure options; setting quality standards for design, systems, and materials; and for short- and long-term budgeting and financing of facility requirements. Facility performance data that is vital to investment decisions can be reduced to two basic questions:

1. **What are the *indicators* of facility performance?** and
2. **What *methodologies* are used to measure performance?**

Among the most common *performance indicators* are functionality, suitability, systems useful life, and utilization. *Functionality* is a measure of whether a given system is operating properly, consistent with its intended design. *Suitability* is a determination of the ability of a system or space to meet current or expected program demands. For example, large classrooms may be perfectly functional, but

the teaching paradigm may be shifting to smaller class sizes, suggesting the need to resize some instructional spaces. An example of the difference between *useful life* and *life cycle* of a given system can be illustrated by the growing need to plan for replacement of computers every three to four years, or sooner, because of rapid advances in technology. The life cycle of computers is generally much longer; but their *useful* life, particularly for certain applications, can be quite brief. *Utilization* may refer to areas such as classroom or class laboratory utilization, energy or utility consumption, or peak hour requirements for parking.

There are two basic methods for measuring facility performance: physical assessments or audits, and statistical assessments. Many institutions use some combination of both of these. Physical assessments usually involve a periodic on-site inspection of spaces and systems by facility staff or consultants, or a team of professionals that could include facility managers or supervisors, engineers, architects, and representatives of departments or programs that occupy a given building. A list of needed repairs or improvements is developed, updated periodically, and used for planning and budgeting maintenance and capital renewal requirements.

Statistical assessments rely on the predicted life cycle of materials and systems by manufacturers and engineering firms, coupled with sampling of the condition of selected systems or buildings. While much less costly and time-consuming than comprehensive physical audits, statistical assessments have proven to be remarkably reliable for predicting capital renewal and budgeting for the reduction of deferred maintenance backlogs.

DECISION PERSPECTIVES

Decision perspectives are the lenses through which the strategic questions, and the metrics and data used to answer them, are viewed. These perspectives include consideration and evaluation of financing or funding alternatives, constraints of operating and capital budgets and related policies, opportunities to acquire new resources, and other economic considerations, including the total cost of ownership. Looking at an investment through these perspectives enables a decision-maker to understand and evaluate the implications of a specific opportunity or need, or an entire investment strategy.

Aligning facilities needs or opportunities with mission or program objectives is, effectively, a "business case" perspective for evaluating a proposed asset investment. The financial or budgetary perspective considers the institution's financial position, and should be grounded by an accounting or financial structure that makes use of common terms and definitions for evaluating the costs of facilities, the inter-relationships of capital and operating budgets; and the establishment of standards based on recognized benchmarks. Such standards may, for example, be related to design criteria, quality of materials, or maintenance.

Where the mission or program alignment and the financial/budgetary perspectives tend to focus more on near-term issues, the economic perspective provides a way of looking at the long term. This context underscores the *total ownership costs* of a given asset investment strategy or, specifically, the cause and effect that those decisions will have on facility life-cycle costs. By doing so, this perspective integrates all cost

categories and provides balance to the decision-making process by addressing long-term, sustainability, and stewardship goals.

CREATING A STEWARDSHIP ENVIRONMENT

Organizations that are effective at managing the physical assets of facilities and infrastructure work within a developed culture of stewardship. This culture is rooted in a deep understanding of how the physical assets provide the environment to achieve the mission and program objectives of the institution.

Effective stewardship also requires a long-term commitment that will ensure appropriate oversight throughout the lifetime of a facilities portfolio. In many cases, particularly for college and university campuses, this must translate to a permanent commitment. There also should be an effective organization and management structure with the necessary expertise and technology support to sustain the investment and assure that mission or program-related goals will be met. Additionally, there should be clear and effective policies and/or legislation, if necessary, to support the preservation and stewardship of long-term facilities assets. Finally, it is important to establish a predictable and, hopefully, stable flow of resources that will sustain a culture of stewardship.

A number of key recommendations or initiatives have been identified in the course of the research that institutional leaders and organizations can implement to support the development of an asset investment strategy as well as to maintain a culture of stewardship. For example:

1. **Link facility investment models and strategies** to institutional mission
2. **Encourage facility managers to employ cost-effective approaches** more common to the private sector (i.e., generic labs, flexible design, etc.)
3. **Continually evaluate new construction** in light of existing capital renewal needs
4. **Assure that facility condition assessments include a building prioritization** that relates to mission
5. **Use models and best practices** from private firms, higher education institutions, and government agencies

As a result, the institution may see the following implications:

- An improved common language for business and facilities officers
- A way to link capital and operating funds
- A more "sustainable" way to look at funding of facilities and infrastructure
- Better accommodation of academic-driven facility upgrades
- Prioritization methods to tie facility needs to institutional mission

It is clearly difficult for most institutions to deflect a generous offer to fund a new building. Donors nearly always want to maximize the amount of space built, expecting the recipient college or university to find the means to operate and maintain programs that will occupy the building as well as its maintenance and capital renewal requirements. But those costs *far exceed* the initial design and construction costs, making it imperative that frank discussions be held about the implications of the *total cost of ownership* before initiating a major capital investment.

This is not only a challenge for higher education. Cities, school districts, religious and nonprofit organizations, and even some government agencies are frequently faced with the same dilemma—the desire to take advantage of a gift, a public bond referendum, or a new federal program that would provide a facility that could not otherwise be built. But the big "catch" is the need to commit to the long-term operating costs which are, more often than not, the most difficult costs to provide and endure over time.

The establishment of an asset investment strategy for a portfolio of facilities will provide a significant benefit to decision-makers, particularly if that strategy is reviewed and updated on a regular basis. Such a strategy can provide a firm foundation for those whose job it is to plan and maintain facilities. It is equally valuable for the consultants, architects, engineers, and contractors in the industry who design and build them, and especially for those boards, legislatures, trustees, and others who must be convinced to find and maintain the resources necessary to support the facilities portfolio over time.

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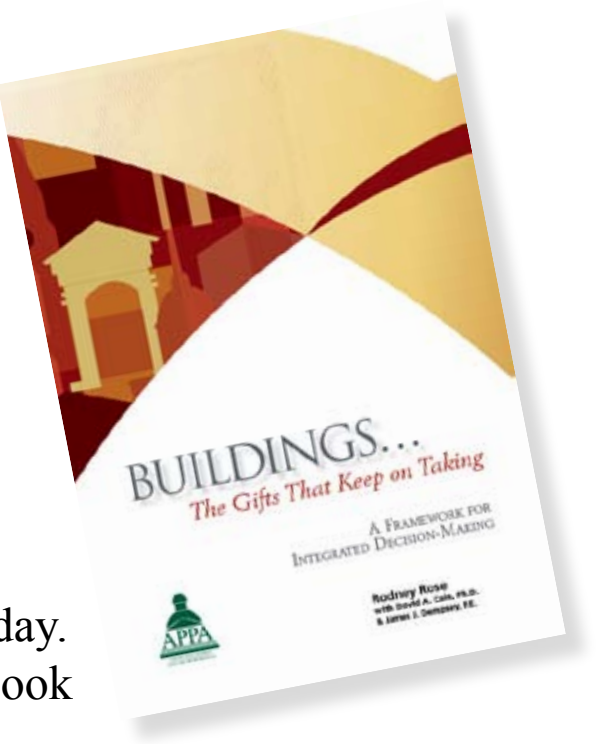

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ISBN: 1-890956-37-6