

Chapter 21

The College and University Campus: Facility Assessments for Long Term Decision Making

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21.1 Introduction

Post-Occupancy Evaluations (POEs) have been defined as “the process of evaluating buildings in a systematic and rigorous manner after they have been built and occupied for some time” (Preiser et al. 1988, p. 3). One important objective of POEs is to glean lessons-learned from the review of completed buildings to improve design strategies for future projects. For Vischer (2001, p. 23), it is about “learning how a building performs once it is built, including if and how well it has met expectations.” This is a ‘rear-view’ approach to POEs, in order to feed forward future design decisions, and has served as an important tool for designing better spaces. Over the many years since POEs were first developed, there has been concern by researchers over the utilization of results by designers (Duffy 2005; Karim and Crozier 2009). In fact, scores of studies and presentations have touched on this issue over the years. The Environmental Design Research Association (EDRA) has published some of these studies and/or hosted presentations as evidenced by conference proceedings since the late 1960s. A common conclusion is that POEs are most useful when results are applied to ongoing building programs where designs are replicated over and over, for example, the U.S. Postal Service’s ‘Store of the Future’ prototypes of the early ‘90’s, or where findings can be generalized to specific types of settings, such as studies on senior housing or hospitals. Generalizing has its own limitations however, with the challenge of control for the many variables that affect person-environment relations.

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Preiser discusses the usefulness and value of POEs for designers to reflect on and review results of their work (Preiser et al. 1988). It has been stated that design practitioners ought to bear the cost of POEs to learn and improve on their design approaches for future projects (Bordass and Leaman 2009). At Perkins + Will and other firms, POEs have been applied through systematic review of building performance such as energy and water use and technical concerns, as well as user and owner feedback. In the world of practice however, challenges remain related to building function and behavioral findings much as in the world of academic research, in particular, resources required (time and funding) to produce generalizable results that apply to every functional dimension of a specific building or space.

21.2 Building Evaluations and Future Decision-Making

Another application of POEs that is addressed less frequently is one of its most powerful, a version of the Building Performance Evaluation (BPE) concept. In campus environments where multiple buildings are owned and managed by one entity, the campus land and facilities must continually be considered a portfolio of assets with buildings regularly assessed for their value and life expectancy. The cost of upgrades to extend a building's life through renovation, along with maintenance costs over time, are compared against the price of replacement. With this approach, life expectancy criteria typically focus on the condition and capacity of a building's physical systems such as structural, mechanical/electrical/plumbing systems (MEP), building envelope, extent of hazardous materials, and compliance with current codes. These are the common drivers for decision making about whether to retain or replace buildings. Often buildings are also assessed for their physical performance, as in energy and water use.

But what about the appropriateness of the building's design for meeting institutional goals and supporting needed activities? Functional criteria that address user needs are not commonly used. This is partly due to the challenge of capturing and evaluating more qualitative data without the use of robust research techniques, such as surveys designed to elicit responses that allow for analysis with scientifically valid results, requiring significant time and cost.

Yet, the role of facilities to serve a need, that is, facilitate a set of activities, is their primary purpose. Understanding how well facilities support user goals and activities through user input and observations can be hugely valuable: Which existing buildings are worth keeping and can continue to support an institution's mission and vision? Which buildings can be adapted at a lower cost, and/or more effectively, than the cost of constructing a new building? Campus environments in particular can benefit from this 'forward-view' approach.

Campus representatives continually face decisions about the future of campus buildings—how to move ahead with the buildings and environments they steward. The steadfast goal must be to support the institution’s mission, which typically encompasses some combination of education, research, and service. Moreover these activities are quickly evolving and changing. For example, new advances in neuroscience have significantly changed our understanding of the way people learn, resulting in direct impacts to curriculum and learning environments (Tokuhamu-Espinosa 2011). The active-learning model where students are directly engaged in problem-solving and team-based work has proven to be highly effective (Freeman et al. 2014). Classrooms that support this new pedagogy must be open, flexible, and fully digital, yet highly accessible with direct visual connections to and among all participants - resulting in more square footage per seat.

Similarly, many pressing challenges of our day are being studied through interdisciplinary research such as Bioengineering and Environmental Sciences. The result is that with research activities are becoming more integrated across disciplines. Direct space implications are that academic environments must encourage, more than ever, interaction, interdisciplinary exchanges and informal, serendipitous encounters.

Such evolutions, including an evolving character of openness and cross-fertilization, are flourishing and extending beyond the walls of higher education. In addition, the Academy’s sense of responsibility to its service role and relationships to external communities is becoming increasingly important, resulting in campuses that are much more porous and integrated with their surrounding neighborhoods. Among the many examples are the University of Washington,



Fig. 21.1 University Crossing, UMass Lowell: Student center with ground level retail along the campus edge. *Source* Edward Dudley, Perkins + Will

South Seattle College, The Ohio State University and the University of Massachusetts Lowell (see Fig. 21.1).

While such evolutions make sense now in the 21st Century (C.), many of the buildings on campuses throughout North America are out of date and do not support new ways of thinking, acting, and operating as an institution. How well do existing 19th and 20th C. buildings support current and future changes in higher education? This is where a functional evaluation that examines an existing building's seminal qualities against the activities that must be supported can be extremely useful. While this approach is not formally called POE in the author's practice, it is very similar to the Indicative POEs described by Preiser et al. (1988).

21.3 Functional Assessments

In campus planning work, the primary focus should always be on the mission and vision of an institution, and how the campus might help these to be achieved through a supportive physical environment. This requires an evaluation of the existing conditions, including campus buildings, by considering their likely future effectiveness and life expectancy to determine whether it makes sense to plan with or without them.

Typically a good amount of time is spent with stakeholders to understand the institution's vision for the future and resulting total space needed based on the institution's culture, expected growth, and anticipated changes in ways of doing things. Depending upon the institution's needs and the focus of the plan, the level of detail studied ranges from a high level campus-wide assessment of space needs to a design-ready, room-by-room program for a specific building.

Space needs are then evaluated against the existing building stock for capacity and condition, answering questions such as: Does the existing space accommodate the need? Will the buildings last as long as they need to? Often the long-term plan incorporates a 10-year capital plan where specific projects are identified. Projects may be 'Growth' projects, to support a new program or increases in enrollment, 'Replacement' projects, to address uncorrectable issues of a specific building, or 'Major Renovations,' where a facility can be corrected and its life extended.

Renovation compared to Replacement decisions require an understanding of building performance, often without the resources and most critically time, to perform a robust POE. So, the most common approach to understanding the value of an existing building focuses on building systems through a Physical Evaluation without understanding function. Yet, a Functional Evaluation can provide critical information to the decision making process.

21.4 Functional Assessments—Data Gathering

Functional Assessments are much like an “Investigative POE”, as they reach out to users, observe users, and develop evaluation criteria. Several social science data-gathering techniques are especially effective including Walkthrough Tours with department representatives and facilities staff; Focus Groups with functional units; and Observations. Observations can be augmented with Geo-based User input via Web Surveys; these can be very effective and powerful.

- *Walkthrough Tours*: This is an initial tour of the facilities, hearing from user representatives and facilities staff about what works and what doesn't. The issues are kept at a high level so as to avoid getting bogged down in the details such as casework fixes or temporary space configurations—high level decisions are what need to be made. It should be noted that, this can also be a time to listen for the opportunity to solve easy-to-solve problems quickly, even while the long term plan is the focus.
- *Focus Groups*: Focus groups allow the team to dive more deeply into understanding the needs and aspirations of each functional unit—both in terms of how they operate and their adjacency requirements. The level of detail varies depending upon the scope of the study, e.g., whether a campus-wide effort or precinct plan is needed, or the effort is centered on specific program functions, like housing, learning spaces, recreation, or workplace, for example. In every case, the discussion generally focuses on how the current facilities fulfill current and expected future needs, both in terms of growth and evolving ways of learning, teaching, research and other work.
- *Geo-based User Input via Web Surveys*: Web surveys have proven to be effective and valuable, particularly for understanding or confirming use patterns at the campus and building scale. Users drag icons on a map or floor plan to places where they typically engage in certain activities such as ‘socializing’, ‘studying’, ‘eating’, or where they see and experience the most problems with ‘wayfinding’ or ‘traffic.’ They can also trace their typical use patterns for walking on campus, driving, or biking. At the University of Oregon, within a couple weeks, the Physical Framework Vision Plan team of Perkins + Will was able to collect information from over 2000 participants with a graphic that compiled all responses to a particular question, real time, and illustrated geospatially (see Figs. 21.2 and 21.3).
- *Visual Observations*: Often the initial walk-through tour is followed by a more detailed team tour to survey each space and gain a sense of its current use, its potential for a new use, and an assessment to ‘right size’ its current function.
- *Documentation Review*: This includes the review of existing space data bases, floor plans, and structural drawings. Databases are organized by functional unit to gain a sense of current space. Floor plans are also annotated by functional unit and reviewed against adjacency needs. Structural drawings are reviewed to understand the building’s capacity to support current or other functions.

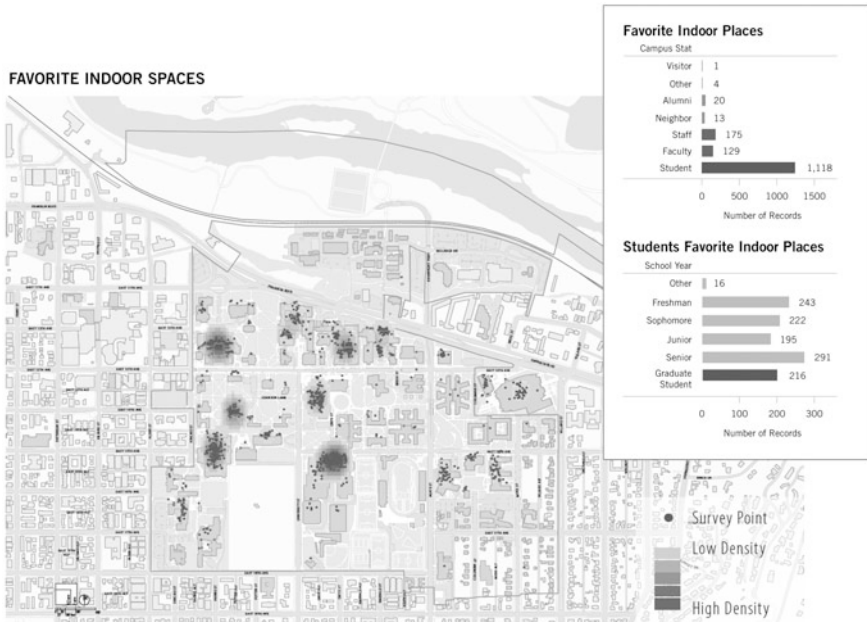


Fig. 21.2 University of Oregon My Campus Survey: Favorite Indoor Spaces. Source University of Oregon



Fig. 21.3 University of Oregon My Campus Survey: Pedestrian Travel Patterns. Source University of Oregon

For example, buildings with large open bays are great for classroom space while more historic buildings might better support offices.

It should be noted that all of the data assembled as described above is paired with physical condition data gathered through tours with facilities staff and document reviews, as well as building performance data such as energy and water use.

21.5 Functional Assessment—Analysis

The Functional Assessment is the result of qualitative analysis by the consultant team, based on the data gathering techniques described above. A list of functional criteria are assessed that relate to permanent characteristics building which supports, or does not support and the overall functions and activities expected to occur in the present and the future are assessed. Each building is evaluated for its ability to support the following without a major overhaul to building structure, envelope, or configuration:

- *Accessibility*: Users' general ease of access, particularly for the mobility-impaired, beyond meeting ADA requirements. See, for example, the *Universal Design Handbook* (Preiser and Smith 2011).
- *Comfort*: A user's general level of comfort in relation to the physical space. This could include floor-to-floor heights, convenient travel throughout, access to daylight. It should be noted that this criterion is not related to the condition or capacity of the MEP System, as evaluated in the Physical Assessment.
- *Image/Identity*: The image and identity of the university, or uses within, expressed by the building. Questions asked include: Is it positive? Aesthetically pleasing? Does it reflect the image and identity of the institution?
- *Flexibility of Uses*: A building's ability to house a range of uses and be converted easily from one to another. For example, from lab to office to classroom, etc.
- *Mission, Vision, and Overarching Goals*: Typically the planning project of which the functional condition is a part, identifies important goals that must be achieved, in addition to support of the institution mission and vision (see Fig. 21.4). Goals may include issues related to the following, among many others:
 - Collaboration
 - Community-Building
 - New and Evolving Pedagogies
 - Growth in Research
- *Program Fit*: A building's ability to efficiently and effectively support its current or needed future use.
- *Wayfinding*: Users' ability to remain oriented within and outside the building

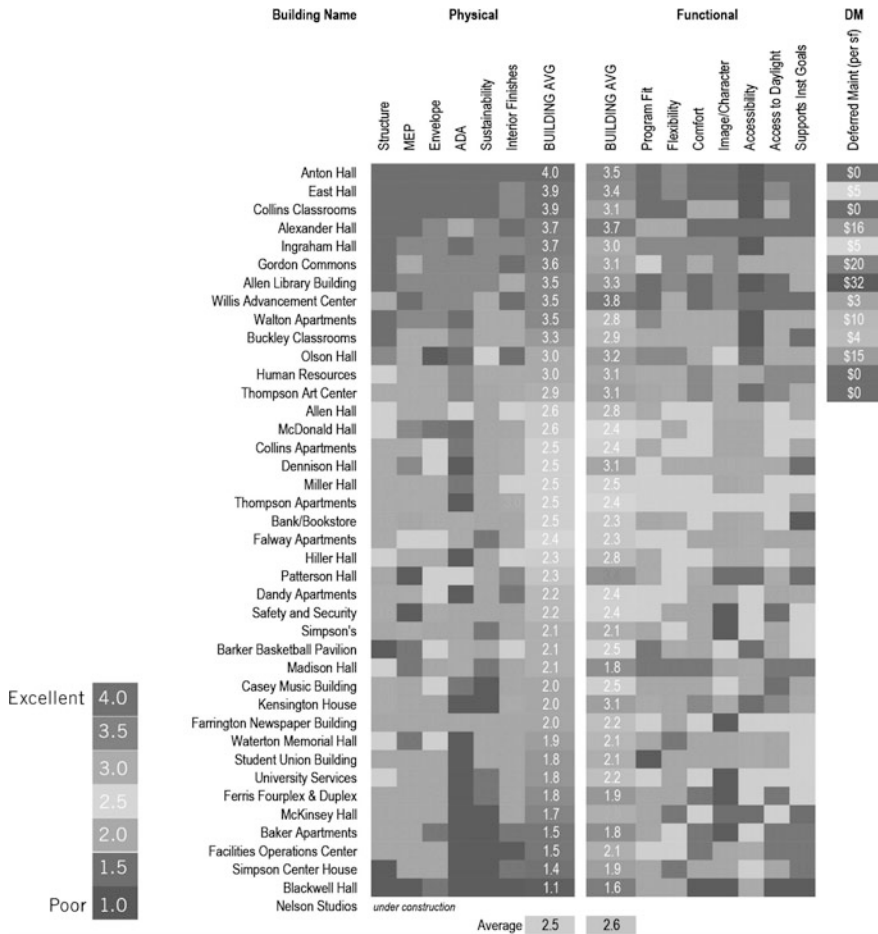


Fig. 21.4 Building Assessment: Physical and Functional Conditions. *Source* Brodie Bain, Perkins + Will

Given the subjective nature of the Functional Assessment method, results of the analysis are reviewed and edited in close collaboration with the users and the core project team. Scores on a 3-point or 5-point scale can be useful with criteria weighted based on issues most important to the institution and users and most supportive of the institution and project goals. In this way, priorities are clearly articulated and discussed, and decisions made with transparency and clarity on institution priorities.

21.6 Conclusion

While POEs are useful to understand the effectiveness of newly completed facilities, their utility can be challenged by realities such as cost, timing, and generalizability. This approach is rear-view-focused, with the results of past work meant to inform future work—critically important, but not the only application of POEs. Another valuable use of POEs is as a tool to help building owners make decisions about the future of existing assets, expanding beyond the physical capacity and condition lens. Functional Assessments, with the use of a wide range of data gathering techniques much like Indicative POEs, are effective in helping owners with a ‘forward-view’ as they determine the long term future value of specific buildings. Campuses can greatly benefit from Functional Assessments. In an era where our understanding of how people learn is undergoing major evolutions along with research and work processes constantly changing, facilities supporting these activities also need to change. Depending upon the goals and desired product, Functional Assessments are tailored to address current and future needs, life cycle cost and timing, and augment the Physical Assessment. The use of comprehensive, efficient, and effective evaluations as part of the campus planning process is important and valuable as institutions seek to determine how to solve current issues and move into their future. This version of Building Performance Evaluation (BPE) helps owners by incorporating evolving goals and offering a new dimension to their decision making process.

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