

FOUR 'BIG ISSUES,' THREE TRENDS IN HIGHER EDUCATION DESIGN



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The Sophia Gordon Performing Arts Center at Salem State University transfigured the Massachusetts school's 1958 Main Stage Theater building from an antiquated general-purpose auditorium into a modern proscenium venue designed for aspiring professionals.

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LEARNING OBJECTIVES

After reading this article, you should be able to:

- + **RECOGNIZE** four common issues impacting today's higher education campus projects.
- + **IDENTIFY** viable strategies to address the challenges for future campus development.
- + **DISCUSS** the impact of interdisciplinary and research partnerships on the evolution of the university's buildings and facilities.
- + **LIST** several ways in which sustainable development affects every dimension of a higher education project.

University and college campuses nationwide are facing historic challenges—pressure to attract the best students, coping with years of deferred facility maintenance, managing physical growth, and meeting elevated expectations for sustainability. Addressing them with today's reduced funding requires new mindsets and dramatic new approaches.

Higher education design is a core practice sector for our firm. We focus on innovative strategies for individual institutions that respond to issues common to many universities. Tackling recent initiatives such as a mass timber cross-disciplinary building, sustainable energy facilities and chiller plants, and new arts centers within historical shells has provided us substantial research and discussion time with key decision makers.

Across the board, we have heard that, while higher education venues face several common areas of concern—“big issues”—regarding the future of their physical plants, other development considerations born from age, location, or institutional evolution differ widely by type.

Public universities, for example, have a fundamental mission to educate the future workforce and advance the culture and economy of their home states. Many public universities that were founded as land grant schools grounded in agricultural and engineering have been transformed into major research institutions of global reach. This has strained their existing facilities, led to the enormous expansion of their campuses, and has spawned entirely new campuses, as well.

Private universities, however, must often contend with maintaining and expanding within the physical constraints of historic campuses and the attitudinal constraints imposed by their strong heritages.

For smaller schools, especially community colleges, their scale and the populations they serve intensify these problems and the urgency to address them. Further, each institution’s goals, mission, and planned path forward are unique. These considerations set priorities for capital planning and campus development, thereby guiding design strategies.

To further explore these matters, we reached out to current and former leaders from Brown University, Harvard University, The Ohio State University, Tufts University, the University of Arkansas, the University of North Carolina, the University of Washington, and Washington University in Saint Louis, whose observations proved immensely informative.

FOUR ‘BIG ISSUES’ ON CAMPUS

Details vary by institution, but four common themes emerged from our discussion with university leaders at these schools.

1. Attracting the best students in an increasingly competitive academic environment.

Each institution, whether working to retain its leadership position or developing programs to improve the quality and diversity of its student cohort, wants design strategies that attract students from a more diverse but shrinking pool of applicants. Decision makers tell us they are looking to facility and campus improvements to help them contend for the best undergraduate and graduate candidates. They see continued and expanded student life investments, furthering their core missions to include more research initiatives, and investing in buildings

and landscapes as key strategies in this effort.

2. Addressing deferred maintenance and antiquated buildings.

Maintenance backlogs have climbed substantially over the past decade. Universities are seeking innovative solutions that address the deficiencies of these buildings, reduce ongoing maintenance, and provide for future flexibility. They are especially concerned about their stock of postwar buildings, specifically those constructed in the building boom of the 1960s and ’70s, as well as the current state of their landscapes.

3. Managing growth for future needs.

Universities want plans to better match their physical environments to prospective needs. For many private institutions, it’s simply a matter of space. Many are landlocked and have run out of buildable sites on their historic grounds. Neighborhoods surrounding their campuses are often firmly established and fielding their own worries about displacement and maintaining their vibrancy.

Many public universities are concerned about unifying disparate parts of campus that developed through waves of building. Those tasked with campus development consistently note a shift away from master plans focused on buildable footprints, to frameworks and precinct plans focused on specific, more immediately actionable initiatives. To maximize their resources, they express a need to improve space use and increase flexibility across all space types.

4. Advancing and ensuring campus sustainability.

Universities demand sustainable solutions as a crucial aspect of campus development. They view this as a non-negotiable institutional requirement that aids in attracting and retaining students, reduces ongoing M&O costs, and responsibly addresses campus growth.

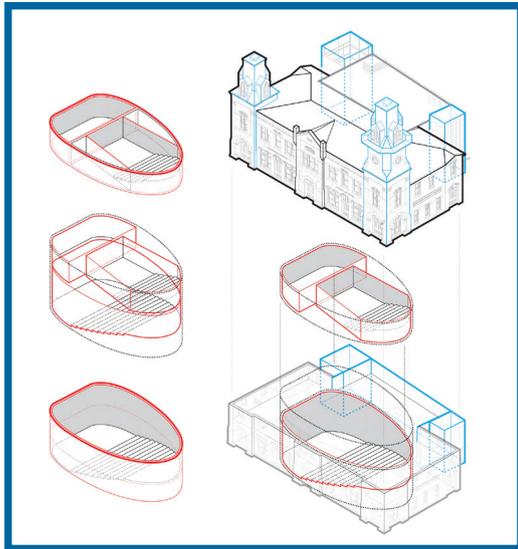
These four functional considerations—our so-called “big issues”—are unyielding and increasingly complex. Capital expenditures are not keeping pace with inflation or growth, especially in the face of national pressure to hold down tuition and fee increases. At public universities, state funding is not keeping pace or is being cut. At private universities, endowment restrictions often limit growth in funding for capital projects.

In sum, the nation’s colleges and universities have to do more with less. They are searching for

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new and diverse funding options. They are generating design and campus development strategies that deliver “maximum benefit” projects more efficiently and at reduced cost. Increasingly, they are using public-private development partnerships (P3s) to reduce their financial burdens.

THREE MAJOR TRENDS ON U.S. CAMPUSES

Faced with common challenges, universities are seeking maximum impact

from design strategies that collectively address more than one of these four “big issues” at a time.

1. Upping the Ante in Student Life

Improving and expanding student life facilities—housing, dining, performing arts, social spaces, etc.—is a high priority for the nation’s 4,724 two- and four-year degree-granting institutions, even as traditional academic space becomes a smaller slice of on-campus construction. These new and reimagined buildings, which often have a much-needed revenue-generating component at a time when enrollments have leveled off nationally, are a key aspect of attracting and retaining students. This new breed of student life facilities also allows higher education institutions to improve campus sustainability, revive the institutional building stock, and improve space use in the process.



The Academic Arts Center at Middlesex Community College, Lowell, Mass., will remake a historic railroad depot into a densely packed center for theater, dance, and music.

Multipurpose student life structures often combine housing, dining, recreation, social, and adaptable learning spaces. Academic buildings now incorporate cafés, lounges, breakout spaces, and advanced technology to enhance informal learning opportunities alongside malleable classrooms and labs. Performing arts centers include study space, lounges, flexible classrooms, and performance spaces that reflect the institution’s broader commitment to community engagement.

Campus housing now fuses diverse residence options with classrooms, maker spaces, dining, fitness, recreation, and social and meeting environments. “Marketplaces” have replaced traditional dining halls, offering higher quality and greater choice of food in a more congenial social atmosphere.

Two recent projects—one that our firm just completed, another that is currently under construction—illustrate our approach to designing for student life concerns.

The completed **Sophia Gordon Performing Arts Center** at Salem State University reconceived the Massachusetts school’s 1958 Main Stage Theater building. The project took an antiquated general-purpose auditorium with a sloped floor filling its entire footprint and converted it into a modern proscenium venue designed for aspiring professionals. The design inserts a professional-level theater at the heart of the building with a full complement of support spaces. The renovation carves out a large lobby lounge area for study with a new public entry and turns a former service yard into a landscaped courtyard for impromptu performances.

The design approach realigns the renovated building with the needs of the school’s award-winning theater program. Its LEED Silver design reduces predicted energy use intensity (pEUI) to 40% below average while taking advantage of the existing building’s location within a larger complex at the campus’s community doorstep. After many years of delays, the project was financed through a private gift and state funding.

The **Academic Arts Center** at Middlesex Community College, Lowell, Mass., now under construction, represents the fundamental remaking of a historic railroad depot into a densely packed center for theater, dance, and music. The college, located on a vibrant urban campus that was developed by restoring and repurposing 19th- and 20th-century commercial and former government buildings within the Lowell Historic Park and city’s historic district as well as the later former

headquarters of Wang Laboratories, has a vibrant performing arts department. To expand the campus to a new corner of the historic downtown, the college acquired a long-vacant rail depot as the venue for its future arts center.

The new facility is designed to meet the teaching styles inherent in the various arts departments. It will nestle a new Off-Broadway-style studio theater, recital hall, and dance/rehearsal studio black box into an egg-shaped structural volume that supports the historic façades. Support space, new seminar-style classrooms, practice space, offices, and meeting space fill out the building. Each teaching venue is designed to be flexible and technologically rich to maximize use of the new facility. The intent of the building is to help the college attract and retain students, grow its music, dance, and theater programs, and enhance its connections with the community.

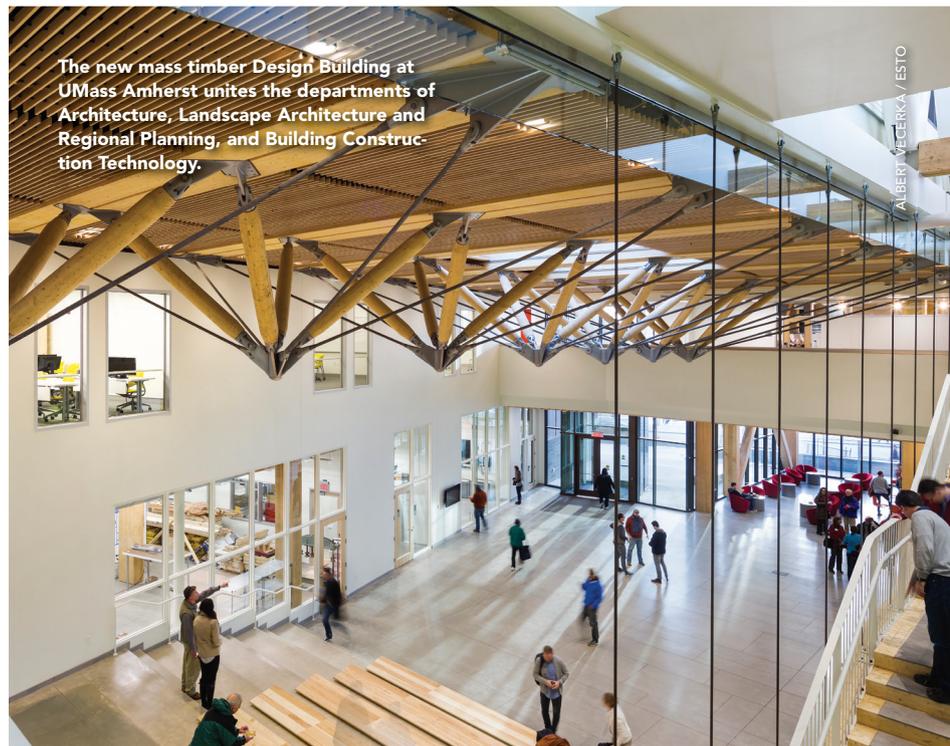
2. Active and Interdisciplinary Learning

The trend toward more diverse and flexible interdisciplinary learning spaces is proliferating in two key ways. Technologically rich and adaptable “active learning” classrooms now allow for flexible configurations aligned with a changing pedagogy that includes project-based learning and collaborations. Maker spaces that connect students to resources and encourage teamwork and exploration with tangible results are rapidly multiplying.

These venues also provide a gateway to collaborations with the private sector and encourage lifelong learning through alumni and community-based programs. Both types of spaces are active, reproducible, and flexible enough to support teaching across multiple disciplines. They maximize space use, address flexible planning needs, and attract and retain students interested in research opportunities and cross-disciplinary learning.

The new mass timber **Design Building** at the University of Massachusetts Amherst represents the convergence of programmatic requirements, site specificity, and inventive thinking that address large campus issues. It unites under one roof the departments of Architecture, Landscape Architecture and Regional Planning, and Building Construction Technology, which were scattered across campus in out-of-date facilities.

The desire to establish a shared identity in the new building generated a model of interdisciplinary, collaborative, and active learning spaces organized around a central Common. The Common fosters a natural sense of formal and informal gathering for students and faculty. Around this



atrium, active learning spaces, a wood testing lab, a project assembly space, a woodshop, and a digital fabrication lab buzz with activity.

The Design Building is at the confluence of academic and student life, linking the classroom core with one of the university’s main dining and housing facilities. The Common is opened up and on display to the campus. It has been configured to the natural slope of the site to encourage students to travel through, pause, and observe the activity humming

The 15,000-ton East Regional Chilled Water Plant at The Ohio State University serves new science facilities. It fits comfortably among its smaller academic neighbors in the growing northeast corner of the Columbus campus.



around them. Coupled with an adjacent café, gallery, and lounges, the Common and the outdoor courtyard above it are social spaces that were designed to promote cross-discipline connections and informal, serendipitous exchanges.

The building's cross-laminated, four-story timber structure—the first and largest of its kind in an academic building in the U.S.—takes advantage of wood as a renewable material through its low embodied energy and carbon sequestration potential. In addition to efficient mechanical systems and smart zoning of heating and cooling, generous daylight spaces reduce the amount of energy needed for artificial lighting.

Made possible through special funding from the Massachusetts State Legislature as a demonstration project based on the Construction Technology department's own research, the Design Building serves as a teaching tool, cultivating collaborative and active learning that integrates academic and student life.

3. Leveraging Institutional Capital

Universities are looking inward to tackle their biggest challenges. Focused on optimizing space use to save money and resources, they are developing space management plans, standardizing classrooms around flexibility and technology,

looking for creative office solutions, and “finding” space in inefficient buildings. They're also reevaluating planning priorities around their schools' core missions. When they do build, they are leveraging their position as the client to demand accelerated project delivery to reduce time-to-market and costs, also requiring such methodologies as integrated project delivery, Lean methods, and design-assist, as well as traditional early packages and preconstruction services.

Colleges and universities are also developing more sophisticated philanthropy platforms. They are going beyond their traditional funding sources—alumni donors, industry, and foundations—and are seeking support from nontraditional populations, including communities of color, traditionally underrepresented populations, women, current students, and extended families. These efforts make universities more informed and insightful clients capable of embracing innovative solutions.

Campus sustainability and energy efficiency can be increased by leveraging campus infrastructure to reduce costs. One option—district energy

plants—can reduce energy use by as much as 50% compared to building-by-building systems, according to a study by the United Nations. They also position campuses to make better use of possible energy sources of the future, such as hydrogen and genetically engineered algae-based biofuels. By centralizing production, district energy plants trim total operating costs, typically extend the life of equipment, and reduce carbon dioxide, nitrogen oxides, and sulfur dioxide emissions. Energy sources can be diversified and redundancy managed more efficiently.

District energy plants can be designed and sized to efficiently house equipment, saving overall space by reducing the amount required in and on each connected building. Without individual cooling towers, boilers, and other equipment for each building, there is greater potential for design flexibility across the campus.

The 15,000-ton **East Regional Chilled Water Plant** at The Ohio State University serves new science facilities. This critically important infrastructure project fits comfortably among its smaller academic neighbors in the growing northeast corner of the Columbus campus. It is held back from the street, carefully massed and playful with transparency that bridges campus-to-city and puts the plant's infrastructure on display.

Designed to support the densely packed equipment layout, both the upper and lower volumes of the building respond to unique engineering requirements: the upper screened volume contains the cooling towers, the lower volume houses the chillers. To minimize the building mass, the pumping equipment is housed in a full basement. The plant was designed so that new chillers and cooling towers could be inserted into the structure, thereby eliminating the need to build a separate addition.

OSU recently entered into a 50-year partnership with a private energy management company, which provides a significant upfront payment of \$1.015 billion to the university's endowment, as well as an estimated \$250 million for conservation measures by OSU and \$150 million to support academic and research initiatives. In return, the energy management company will operate all campus energy facilities, including the East Regional Chilled Water Plant.

Private-sector alliances are another route that universities are taking to strengthen their relationships with the business sector. Led by private research institutions, they are developing “innovation precincts,” or research complexes, on and off campus, to foster collaboration between academia

DISTRICT ENERGY PLANTS CAN REDUCE ENERGY USE BY AS MUCH AS 50% VERSUS BUILDING-BY-BUILDING SYSTEMS.

and industry, as well as startups and business incubators to create a more direct path for students from the classroom to the workforce.

University partnerships with developers are expanding to deliver and manage student housing. These public-private partnerships allow institutions to use their own limited capital funding for high-priority, non-revenue academic projects while addressing maintenance backlogs and reducing time to market for revenue-sensitive facilities like student housing and parking. P3 models have become increasingly popular with institutional investors. They have the potential for dramatic expansion as traditional funding shrinks. For colleges and universities, P3 alliances offer the opportunity to provide funding, create opportunities, and reduce risks associated with building on campus.

DESIGNERS NEED TO UNDERSTAND the trends defining today's campuses and the big issues shaping them.

To maximize financial investment, capital planning projects must address multiple issues in one

package—deferred maintenance, new collaborative learning spaces, and enhanced landscape identity. This is fundamental to campus design today.

Universities see investment in student life facilities as crucial to attracting and retaining the best students. They also see the potential for these projects to address growth and maintenance concerns. Sustainability must remain an integral part of every campus, not simply an added feature.

The relationship between college and university research and private-sector R&D will also be an important consideration for future campus development, whether integrated in the campus fabric or in large new districts. Innovative thinking and collaborative design partnerships will be required to lead higher education campus design into a brave new future. +

+EDITOR'S NOTE

This completes the reading for this course. To earn 1.0 AIA CES HSW learning units, study the article carefully and take the exam posted at BDCnetwork.com/HigherEdIssues2017



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SAMPLE LAYOUTS

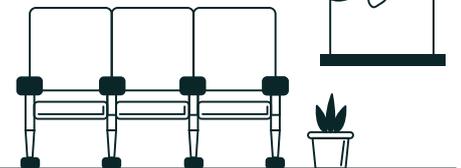
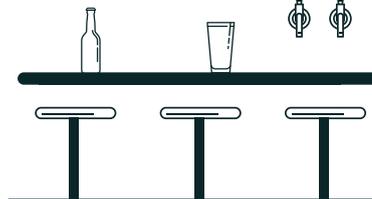
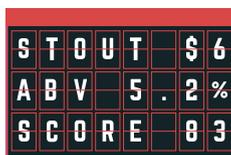
Our design is built to fit your space. Split Flaps can grow from entry model of 3 rows of 16 columns, up to 20 rows of 32 Columns!



EVEN LARGER
12R X 32C (77" X 96")

LARGE
9R X 24C (59" X 72")

STANDARD
3R X 16C (23" X 48")



 **CUSTOMIZABLE**

- Character type, font, color
- Screen print header
- Cabinet/Flap color
- Content management
- API Calls

 **OPERATION**

- 50 Characters (flaps) per module
- Cloud based manual or auto messaging
- UL Certified & FCC Compliant
- 120VAC (configurable to 240 VAC)