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FEATURE ARTICLE

Campus Historic Preservation and Adaptive Reuse Leverage These Tools to Achieve Your Planning and Sustainability Goals

by Meaghan Finney, MS, and
Michael Patrick, MArch, AIA, NCARB, LEED AP

By integrating historic buildings into your campus planning, their continued reuse can help solve some of the specific challenges facing university planners today.

This article represents an editorial collaboration between the Society for College and University Planning (SCUP) and the Association for Preservation Technology (APT) <https://www.apti.org/>. The latter is a multi-disciplinary organization dedicated to advancing traditional and new technologies for the preservation of historic structures, including those found on college and university campuses.

Virtually all college and university campuses have at least one historic building in their inventory and, for many, older buildings comprise a high percentage of building stock. Those buildings are often perceived as more of a burden than anything else, but this does not need to be the case if they are fully integrated into your planning framework. A 2021 article, “Your Campus Historical Buildings: Flagships for a Sustainable Future,” contributed by Association for Preservation Technology (APT) authors to *Learning by Design*, explained the basics of incorporating historic buildings into your campus planning, specifically in the context of sustainability. But how can these structures help to solve some of the specific challenges facing university planners today?

The Spring 2022 edition of the Society for College and University Planning’s (SCUP) *Trends for Higher Education* <https://www.scup.org/resource/trends-inside-higher-education-spring-2022/> outlined



some of these challenges: planning for a leaner operational model, increased student activism on social and environmental causes, and managing growing backlogs of deferred maintenance. Many challenges described are not necessarily new, but planning professionals are facing them in a changed—and changing—landscape. The concept of resilience is emerging as a touchpoint for planners seeking to meet their current and anticipated future spatial needs, maintain sound financial strategies, and operate efficiently within established institutional frameworks. If you consider historic resources as tools in meeting your specific planning challenges and achieving resilience, they can become assets instead of problems.

Adaptive Reuse as Contemporary Resilience

Colleges and universities are, first and foremost, institutions of higher learning with education as their primary mission. The purpose of a campus's built environment is to support that mission by providing classrooms, offices, dorm rooms, dining halls, and the plethora of other spaces necessary in a living/learning community. However, the buildings of the past often no longer align with the academic and student life experiences institutions want to offer. The “traditional” 20th century (and earlier) classroom featured rows of single desks pointed toward a central teaching wall where the professor would stand and lecture, writing notes on a chalkboard for students to copy. The pedagogical shift within higher education toward experiential learning models, where students are actively engaging with the professor and each other, is changing how classrooms are designed. Similarly,

libraries are also moving away from a traditional model of book stacks punctuated with isolated study carrels. That's because technology has changed how students research and study. In both libraries and classrooms, as with most campus environments today, students expect technology that is omnipresent and integrated throughout.

Contemporary campus libraries are now prioritizing flexible open spaces that can be used for group collaboration *and* individual study, often moving their book collections either out of sight or off-site altogether. Flexibility is often also a desired trait in new learning environments as it can accommodate different types of classes in a single space, as opposed to supporting different types of classes in their own spaces. Active learning classrooms with flexible furnishings typically have a larger footprint than traditional classrooms, because the furniture itself can have a larger footprint, which impacts the spatial utilization of new or renovated academic centers. When the design can achieve the same programmatic goals in fewer overall classrooms, that ultimately results in space savings even if each individual classroom is slightly bigger than normal. Space utilization studies can help institutions understand their own usage patterns and identify where such solutions might make the most sense.

Case studies show that existing historic facilities can be successfully retrofitted to meet many of the needs of modern learning spaces while eliminating the significant carbon cost of building an entirely new facility and achieving other important planning goals. The large footprints, open spans of uninterrupted space, and other desired elements associated with



common campus spaces like larger classrooms, libraries, and dining halls are sometimes difficult to achieve with buildings that pre-date the post-war boom of the mid-20th century. However, interior walls can in some cases be removed, and updated HVAC systems installed, to create highly desirable spaces in historic buildings that retain important cultural meaning for the institution, cost less than new construction, and help reduce the campus carbon footprint by adaptively reusing an existing building. More modern buildings can be even easier to adapt.

While people do not always associate modern architecture with historic preservation, if a building was constructed before 1972 it is at least 50 years old and technically qualifies as historic. There are many

successful case studies for the preservation and adaptive reuse of midcentury buildings in a diverse array of contexts, including several on campuses nationwide—although repurposing a historic building involves different strategies when the original design included vast amounts of concrete and glass, elevators, and air conditioning. Recent winners of the annual SCUP/AIA-CAE Excellence in Architecture Awards include the transformation of a 1960s law school building at the University of Kentucky; the complete renovation of a 1966 library at Arizona State University; and a rethinking of a four-building fine arts complex built in 1963 at Macalester College, proving that it can indeed be accomplished with tremendous results.

Figure 1 **University of Kentucky Rosenberg College of Law**



Credit: ©Tim Griffith



Figure 2 Macalester College Janet Wallace Fine Arts Center



Credit: Paul Crosby Architectural Photography

For institutions exploring the adaptation of historic buildings, regardless of their vintage, establishing a trusted expert team of consultants is the best way to maximize value and make the most of the existing building. You will want a team of firms that understands both the technical aspects of historic preservation—critical to unlocking creative design solutions—and the cultural context of higher education, which can often be a very different project management environment compared to other markets. SCUP members are part of a unique community of fellow institutional planners, and there is almost certainly another member who has faced issues similar

to those that might be challenging you right now. The SCUP Listserv <https://www.scup.org/join/listserv/> can help connect you, or you can seek in-person networking opportunities through conferences and symposia <https://www.scup.org/conferences-programs/?filter-reset=yes>. Similarly, APT and its members can offer guidance on restoration and rehabilitation for virtually any historic building, system, or material. Local chapters can help direct you toward professionals who are active in your area, or you can view the online directory of firms that support APT at a national level to begin identifying potential partners.



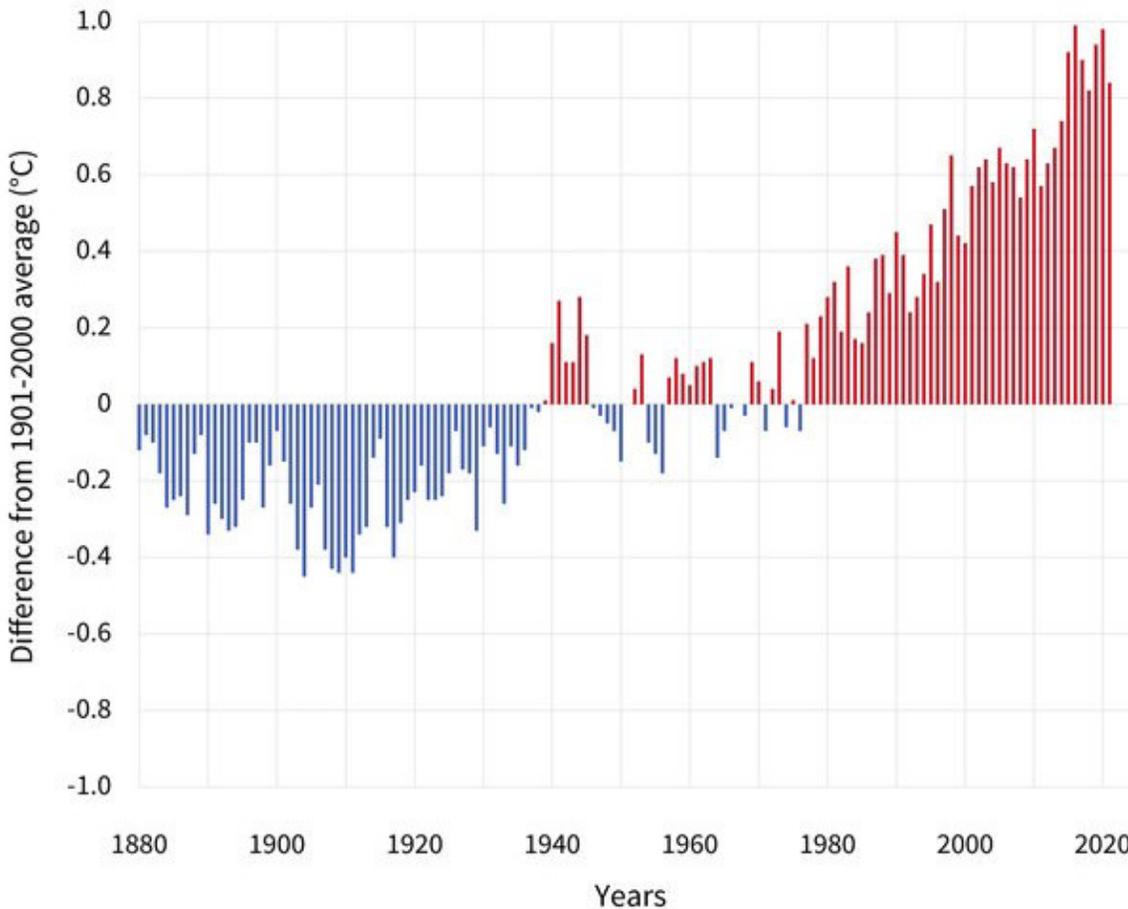
“Institutions should utilize experienced professionals with an in-depth understanding of the materials and construction being assessed and practical knowledge of historic preservation,” says Paul Gaudette, a principal with Wiss, Janney, Elstner Associates, Inc., a firm involved with SCUP award-winning projects at Yale University and elsewhere. “These professionals can provide guidance and a road map for practical options and solutions for repair, rehabilitation, and restoration of historic buildings.” APT also offers a wealth of online resources and publications that can be helpful for facilities departments, most of which do not have trained preservationists on staff, in

understanding and implementing maintenance plans of historic buildings.

Adaptive Reuse as Achieving Carbon Neutrality

Climate scientists have measured the recent increase in the global average temperature to approximately 2°C above pre-industrial levels. The Paris Agreement proposes to mitigate the effects of climate change by taking steps to limit that increase to 1.5°C above pre-industrial levels, which will require all buildings—new *and* existing—to be net zero carbon by 2050.

Figure 3 Average Global Temperature Change Over Pre-Industrial Levels (NOAA)



Source: “Climate Change: Global Temperature Chart,” National Oceanic and Atmospheric Administration (NOAA), June 2022

Case studies show that existing historic facilities can be successfully retrofitted to meet many of the needs of modern learning spaces while eliminating the significant carbon cost of building an entirely new facility and achieving other important planning goals.

California has updated building codes statewide in a move toward zero-carbon emission buildings, with obvious implications for institutions pursuing capital improvements. Other states and local municipalities have followed suit, but in much of the United States building codes are not aligned with effective carbon reduction. However, SCUP's Spring 2022 *Trends in Higher Education* noted that: "Sustainability initiatives remain important in higher education." More institutions are voluntarily committing to achieving carbon neutral campuses, and hundreds have already committed to the Presidents' Climate Leadership Commitments, which seek to reduce higher education's impact on climate change through a commitment to sustainable campus design.

Initiatives that derive from the Climate Leadership Commitments usually have a quantifiable impact on a signatory's planning and design standards, but even colleges and universities that have not made a formal commitment are seeking to reduce their environmental impact in their own ways. Many institutions, for instance, have adopted policies requiring that capital projects achieve LEED

certification or higher and have incorporated such rules into their campus planning framework.

Sustainable design certifications and historic preservation are not at all mutually exclusive. The US Green Building Council (USGBC) has demonstrated clearly that historic buildings can successfully achieve LEED certification, and one of the oldest LEED-Certified buildings in the world is actually a university building: a Venetian palazzo built in 1453 that today houses the Ca' Foscari University of Venice. In 2018, it even reapplied for and successfully achieved LEED Silver Certification. There are also domestic and international case studies that show historic buildings can comply with passive house and net zero standards.

As an international association, APT has an active partnership with GBC Italia, a counterpart to the USGBC, responsible for overseeing the equivalent of LEED certification in Italy. GBC Italia recently launched a protocol for historic buildings that is specifically intended for application on buildings constructed before 1945. It balances standard ecological concerns—energy, water, indoor quality—with a category that measures the project's consideration of the building's historic value. Building investigative analysis, development of an appropriate maintenance plan, and the compatibility of new materials with historic fabric are a few of the ways project teams can earn credits under that category. Although it has not yet been adopted in the US, the GBC Italia protocol can still be a useful tool in thinking holistically about balancing preservation and sustainable design.



A key consideration is that even the most energy-efficient new building conceivable requires a great deal of carbon to build, while an existing historic building has none of that carbon impact—and a much smaller carbon input is required to make it a modern, functioning building. Michael Patrick, this article’s coauthor and a principal at BarnesVanze Architecture, points out that: “Bending the carbon curve down enough to make a real difference in stopping climate change cannot be achieved solely by the construction of new energy-efficient buildings. It will require that society reuse its existing stock of buildings to avoid the added carbon cost of new construction. If there is one lesson that I hope people take away, it’s this!”

New building technology innovations are making it easier to demonstrate a commitment to sustainability by achieving the performance levels necessary to secure certifications such as LEED with minimal impact on existing historic fabric. Patrick says that variable refrigerant flow (VRF) systems have emerged as an excellent option for adaptive reuse projects. “VRF is a great example of a system that operates with a high degree of efficiency and exceptional opportunities for local control that are important features of perceived comfort,” he says. “It relies on flexible copper piping for delivery, which can run almost anywhere with little disturbance to existing spaces. Instead of a dropped ceiling for ductwork or bulkheads for hot and chilled water piping, the existing ceiling can remain in its historic, and simpler and more attractive, configuration, with the refrigerant lines running invisibly behind them. If the system is so designed, it offers tremendous flexibility, such that one room could be in cooling mode and the next in

heating mode, if the situation required it.” Solving the often complex technical question of how to integrate new systems without destroying the character of the existing building is an important step toward demonstrating that adaptive reuse can indeed be a viable solution and one that has inherent ecological benefits.

The Zero Net Carbon Collaboration (ZNCC) can connect you with resources to help plan for reducing the carbon impact of the existing and historic built environment. APT member Lori Ferriss, the director of sustainability and climate action at Goody Clancy, was involved in the ZNCC’s development of the CARE (Carbon Avoided: Retrofit Estimator) Tool, which will be used for calculating and comparing the embodied, operating, and avoided carbon impacts and benefits of reusing and upgrading existing buildings or replacing them with new construction. According to Ferriss: “The CARE Tool, which is now a project of Architecture 2030, was developed to allow a wide audience, ranging from owners to planners to heritage officers, to quickly understand the total carbon benefits of reusing and upgrading existing buildings compared to replacing them with new construction. Set to launch as a free online tool late in 2022, the CARE Tool will empower higher education institutions to incorporate building reuse into their climate action planning by offering a simple way to quantify the environmental impacts of reuse as a mitigation and adaptation strategy.”

But with such data becoming more available, how are institutions leveraging this knowledge in their planning? A May 2022 study led by Goody Clancy at



Agnes Scott College sought to quantify the positive contributions of historic preservation to reaching carbon neutrality by the college's target year of 2037, noting that roughly two-thirds of its campus buildings were built before 1972 and thus qualify as historic. The study found that there is a 38 percent reduction in total carbon emitted into the atmosphere between the approach that focuses solely on high-performance new construction to reduce emissions, compared to that

which maintains, upgrades, and renovates all existing buildings—including older historic buildings. “These findings reinforce that renovating historic buildings is not just about looking at the past, it is also part of building a better future,” according to Leocadia I. Zak, the president of Agnes Scott College. “The college will immediately use this information as it moves forward with the renovation of the oldest building on campus, Agnes Scott Main Hall, built in 1891.”

Figure 4 Agnes Scott College Main Hall



Credit: Agnes Scott College

Improving the efficiency of historic buildings typically leads to savings in the form of reduced energy costs, and colleges and universities, given their long-term stewardship over their built resources, are uniquely positioned to realize these savings.

Adaptive Reuse as a Financial Benefit

Traditional historic buildings were often built with inherent passive design strategies, like siting a building to take advantage of prevailing breezes, because they did not have modern HVAC or other systems to maintain interior comfort. Over time, though, the performance of such buildings can degrade due to deferred maintenance or inadequate repairs. Improving the efficiency of historic buildings typically leads to savings in the form of reduced energy costs, and colleges and universities, given their long-term stewardship over their built resources, are uniquely positioned to realize these savings. That same long-term stewardship means that institutions are not considering the full picture when they choose not to improve the energy performance of their buildings.

Wendy Hillis, a university architect and associate vice chancellor at University of California, Berkeley, acknowledges the ecological benefits of reusing buildings: preserving the embodied carbon, avoiding demolished materials going to landfills, and negating the need for the resources necessary for new construction. She also agrees that universities are better served by investing upfront in a building's

performance. “Unlike a traditional developer, we hold our buildings for decades, if not centuries. As financial resources for building maintenance (usually the source of the deferred maintenance backlog) are stretched thin, we prioritize highly resilient designs, materials, and details with long life spans. Lifecycle costs absolutely play into this discussion, as we often have more resources on the capital side than the operational side of campus facilities.”

Nevertheless, deferred maintenance of existing buildings continues to be a critical operational and financial issue for many institutions. Condition assessments, a recommended part of every campus facilities plan, are critical to developing a maintenance program that will help ensure buildings meet a given performance baseline. Even a plan to complete relatively small tasks like replacing weatherstripping, for instance, can have an outsized impact on a building's performance. When applied to several buildings, that impact can become demonstrable at a campus-wide scale. Assessments and maintenance plans should both be updated regularly. Making an informed decision on whether to reuse or rebuild, from a sustainability perspective as well as in the context of evaluating long-term operational costs, requires understanding the potential energy performance of the existing building. When pursuing capital projects, though, the financial benefits of improving the performance of an existing building are not always factored into the decision-making process. Hillis notes: “Evaluating full lifecycle costs, and benchmarking these against other buildings of similar size, doesn't solve the long-term maintenance issue but can help ease the perceived negative of retaining historic fabric.” Cost estimates are typically



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limited to construction costs, which only provide part of the picture. Institutions must look at their own internal data on energy costs to generate their estimated savings, or engage another consultant to do that evaluation instead.

Reduced funding can put a strain on institutions working toward achieving their planning goals, often with a direct impact on facilities planning in particular. End users and facilities personnel alike become tasked with doing more with less, and programmatic elements that were included in a planned project may get removed as budgets shrink. The ripple effects of inadequate funding can make reusing existing buildings an even more important solution.

Heidi Fichtenbaum, a senior project manager at Fairleigh Dickinson University, believes that the funding issues plaguing so many institutions have led to a silo mentality that is counterintuitive to what students need and that directly affects campus planning and design. “In the past decade,” she says, “US higher education funding has fallen well below where it was a decade ago. In 2017, states spent \$9 billion less on higher education than they did in 2008. That resulted in 44 percent less money spent per student, on average. Institutions have worked to offset these reductions by increasing tuition, but they’ve also been

forced to cut funding, lay off faculty members, and reduce academic opportunities.”

More recent data collected by the State Higher Education Executive Officers Association for fiscal year 2021 showed that pandemic-related federal stimulus funds provided a welcome boost to institutions in many states, with funding levels rising 4.5 percent above inflation. However, their report noted continuing declines in enrollment and tuition revenue, implying that funding levels will continue to be an issue on many campuses.

However, Fichtenbaum also notes funding levels impact the experience institutions are delivering to students: “As budget requests travel up the leadership chain in this funding-scarce environment, departments feel a need to protect their turf. Those territorial instincts mean departments and offices are not sharing ideas or resources. Over time, that can even lead to a duplication of efforts, effectively wasting already scarce resources. This generation of students who are facing existential threat of climate change can ill afford to spend time in such a model. The scale of the problem demands collaboration and innovation that lies in the interfaces between disciplines and space.”

Planners already appreciate the value of collaboration and innovation, and in how creative design solutions can embody both of them. Making adaptive reuse a first-look on every project can unlock the hidden potential of your historic campus resources by helping your institution respond to a changing financial landscape.



Adaptive Reuse as a Solution

A data-driven approach to choosing between adaptive reuse and new construction continues to show that, in many cases, adaptive reuse can indeed achieve the project goals with a reduced ecological impact and, often, with long-term financial savings. The SCUP/AIA-CAE Excellence in Architecture Awards recognize renovation and adaptive reuse projects annually, and teams regularly present on their successes—and their lessons learned—at SCUP’s regional and annual conferences. As your link to a robust international preservation technology community, APT can play a similar role to SCUP in connecting you with professionals who have already dealt with some of the same issues as you are. As SCUP and APT continue to collaborate, there will be additional opportunities to learn more about the intersection of campus planning and historic preservation.

Campus planners who are not fully leveraging the opportunities offered by the adaptive reuse of older buildings are leaving tools in their toolbox when it comes to developing a planning framework that responds to today’s challenges. Seek the highest and best use for your existing historic building stock, in line with broader institutional goals like achieving carbon neutrality or minimizing building costs. Making the most of every inch of your campus environment can help build a more resilient and adaptable institution—and a more sustainable future for everyone.

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Author Biographies



MEAGHAN FINNEY, MS, is director of communications at Voith & Mactavish Architects LLP in Philadelphia, a firm that specializes in educational design and building preservation. She is a member of the SCUP Mid-Atlantic Council, co-chair of the region's 2023 conference, and serves on the board of the Delaware Valley APPA chapter. Finney volunteers regularly with Philadelphia's historic preservation and architectural community, and has been co-chair of AIA Philadelphia's Historic Preservation Committee for almost 10 years.



MICHAEL PATRICK, MARCH, AIA, NCARB, LEED AP, is a principal and partner with BVA/BarnesVanze Architects Inc., in Washington, DC, where a substantial number of projects are designated as historic landmarks or having historic value. BVA has been a member of the Association for Preservation Technology for several years, and Patrick sits on the board of the organization and its technical committee on sustainable preservation. He believes the adaptive reuse of historic existing facilities is an essential part of meeting global sustainability goals.

Engage with the Authors

To comment on this article or share your own observations, email finney@vma1.com or mpatrick@barnesvanze.com.



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Society for College and University Planning
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2022. | ISSN 0736-0983

Indexed in the Current Index to Journals in Education
(ERIC), Higher Education Abstracts, and Contents
Pages in Education. Also available from ProQuest
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P.O. Box 1346, Ann Arbor, Michigan 48108.

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learning, and expanded conversation, we help create
integrated planning solutions that will unleash the
promise and potential of higher education.

Our community includes colleges and universities
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presidents, provosts, and other senior roles, to those
who are in the trenches, such as chairs, directors, and
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to planning that builds relationships, aligns the
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V50N4 July–September 2022 | i
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