State of Facilities in Higher Education

2017 BENCHMARKS, BEST PRACTICES & TRENDS
Executive Summary

Welcome to the definitive document on trends impacting higher education facilities across the United States and Canada. In its fifth year, the State of Facilities in Higher Education Report shines a spotlight on the trends and best practices that dominated 2017 and will continue to influence campus facilities across North America in 2018.

From the holistic view this report affords of the challenges facing higher education institutions—notably large segments of aging building stock and flattening if not declining enrollment trends—it’s extraordinary to see that many higher education decision-makers are choosing to add new buildings to their campuses. While our research indicates that institutions are taking steps to invest more strategically in facilities resources, the vast majority continue to underestimate the renewal needs of deteriorating spaces while pushing high-risk investments into new facilities.

Based on Sightlines’ analysis of data on capital and operational budgets, we’re certain that this trend will level off. The only question is, when? As a result, it is more critical than ever that institutional decision-makers be armed with an understanding of how to strategically manage their growth and lower operational demands across all facility types.

Toward this end, this report will focus on three areas that should influence institutions’ facilities planning: growth, investment, and the budget/service relationship.

**GROWTH** — Enrollment growth has flattened out over the last several years, and in numerous sectors has been in serious decline. Yet the pressure to sustain current operations and fill empty classrooms and residential facilities has compelled many schools to build even more space in hopes of attracting new kinds of students and retaining a larger percentage of those already attending. This situation raises many stewardship concerns, and the persistence of the practice is surprising for several reasons:

- There is no evidence that correlates the creation of new space with increases in enrollment.
- Absent a more complete strategy, this is a high-risk approach at a time when available resources at all but the wealthiest institutions leave little room for error.
- Enthusiasm brought on by the creation of new spaces masks the presence of persistent challenges presented by older existing buildings within the campus portfolio.

**INVESTMENT** — Two large waves of new construction over the past 50 years are placing tremendous simultaneous stress on budgets. Life cycle maintenance needs already outstrip available resources from both recurring and one-time funding sources.

- While the oldest of campus buildings demand attention today, renewal needs coming due over the next 10 years from buildings constructed between 10 and 25 years ago represent the single largest pool of costs to be addressed by already stressed campus budgets.
• Overall investment has been up or at least flat in universities over the past decade. At the same time, the entropic demands of buildings and their systems have marched forward. The result? Institutions everywhere are falling further behind target spending needs and growing their deferral lists.

• Replacement and renewal demands surge in the first part of the next decade, placing stresses on finance leaders far sooner than many are expecting.

**BUDGET/SERVICE RELATIONSHIP** — With budgeted resources not growing at the same pace as the amount of space on campus, service levels are invariably at risk. The complexity being introduced into new and renovated space during the last wave of construction further impacts the ability of operational teams to sustain existing service levels, let alone enhance them.

• Inflation has grown at nearly twice the rate of operating budgets over the past ten years. Operational creativity and technology innovations are not keeping pace with the demands placed on both new and existing spaces.

• Coverage areas are growing for maintenance and custodial teams, particularly where budgets are dropping. It is more critical than ever to choose carefully which skills are deployed on operating teams.

• Schools continue to recognize the importance of first impressions, as landscape staffing and investment are largely exempt from the trend to reduce staff and budgets.

**ADDRESSING THE CHALLENGE** — Given the demands of managing more space with fewer resources and at greater impact to the institution’s overall recruitment and retention goals, successful facilities departments are being pushed to develop creative responses to these challenges. Communities might be driven to address one or more major factor, such as managing risk, reducing repair and renewal needs, reducing effective building age, or improving service delivery. We have identified the following particularly effective responses this year:

• Maximize investment return
  • Invest with space utilization in mind
  • Connect renewal to modernization
  • Invest to reduce current costs

• Champion not investing — particularly if it conflicts with maximizing return

• Organize strategically to optimize service effectiveness and operating efficiency

Every campus we see successfully tackling these challenges has in place programs to analyze their data and utilize comparative metrics to track performance, communicate accomplishments and articulate needs to the community or leadership.
Introduction

This is the fifth consecutive year Sightlines has published the State of Facilities in Higher Education report, the definitive document of record for North American campus facilities trends. With the modern campus at a crossroad where the intersection of space, capital, and operations – and how those issues are addressed – spells success or failure, facilities decision makers need reliable resources upon which to build their strategies. This report was designed to help you put trends analysis to work in your own facilities strategy.

Data reviewed for this 2017 report revealed several key insights into the challenges—and opportunities—faced by campus facilities and finance leaders. As we've noted in past editions of this guide, campuses are impacted both by continuing trends and evolving or emerging issues. Each year, however, we see campuses across the country deploying innovative actions and strategies to address these challenges.

The 2017 State of Facilities in Higher Education draws from the largest verified database of college and university facilities metrics in the country.

- The database features over 400 campuses in 44 U.S. states and four Canadian provinces tracking over 1.5 billion gross square feet of space.
- All data is collected and verified by Sightlines professionals.
- The database includes 60% public and 40% private institutions with a mix of large, medium, and small institutions.
- The database currently tracks $13.2 billion in capital & operating budgets, 52,200 buildings, and 3.1 million students.

Data collection

Each year, we visit campuses from across North America to collect data on 200 indicators of facilities and financial health. We then compile that data in a comprehensive database. Given the size, completeness, and consistency of our data over time, our confidence is high that our analyses of campus facility trends are valid and reliably represent the higher education industry.
Key trends and insights

The 2016 data reveals notable activity in growth, capital investment, and service — all of which are important trends in campus stewardship:

GROWTH
A disconnect continues between space and enrollment growth. However, the 2016 data indicates that this disconnect is not consistent across schools. A variety of strategies are being deployed to address changes in enrollment. Some of the more conservative strategies position schools to respond to a variety of future contingencies, while riskier strategies are putting schools in a highly leveraged position that assumes future trends will move enrollment in the desired direction. Any significant drop in enrollment at these latter institutions could place them in financial peril.

INVESTMENT
Two waves of major new construction over the past 50 years are placing tremendous stress on the capacity of institutions to care for their existing facilities and support student programs. With multiple building system life cycles coming due simultaneously, schools must prioritize renewal and repair investments across their building portfolios, focusing on the spaces most critical to their educational mission. Unfortunately, investment in new space continues to draw precious resources from existing aging buildings, while masking the overall age profile of the total campus properties. Now is the time for institutions to seriously assess the ongoing value of existing facilities.

SERVICE
Operations funding has growth lethargically since the arrival of the great recession, increasing at about half the rate of the Consumer Price Index (CPI). Organizational creativity and technology innovations have helped to offset these trends in some cases, but these solutions may also prove to be a source of complexity that could risk future performance. Moves to strengthen decision making and emphasize specific trade skills are common responses to constrained budgets.

Integrated Campus Stewardship
At first blush, these trends may seem overwhelming for facilities managers and finance leaders, but many higher education institutions are putting strategies in place to combat these trends. The most effective strategies integrate space, capital, and operations management concerns, as depicted by the image to the left.

By taking a holistic approach to the challenges facing higher education institutions, campus leaders find they can do more with their existing resources and better manage risks. By examining the data trends in this report in terms of how they affect the integrated management of space, capital, and operations on campuses, institution decision makers can position their campuses to thrive despite multi-pronged challenges.
Growth Sustains Some Campuses, Poses Risk to Others

Space growth has continued, despite relatively flat enrollment statistics. While some campuses are indeed chasing rising enrollment, many others are pursuing a high-risk strategy to build their way out of the enrollment doldrums. The effectiveness of this approach remains to be seen.

At a glance, enrollment trends nationally do appear to be tipping up slightly, after several down years.

But this trend does not tell the whole story. The Carnegie Classification system has been used for years to gather schools into like groups for comparative purposes. Upon overlaying the classifications of Research, Master’s and Baccalaureate on the national data, some particularly striking trends start to appear.
Today’s research universities are continuing to see tremendous growth. New construction, for these institutions, is often about keeping up with demand and providing adequate space for the students flocking to their doors. Some prudence in not overbuilding is in order, and a trend that lags enrollment growth is probably wise.

The masters and baccalaureate institutions, however, are facing very different trends. The creation of new space in these cases is not about enrollment. Instead, it is an effort to sustain existing enrollment interest and attract new students with appealing new academic programs or student life features. This “build and they will come” approach is extremely optimistic at best; at worst, it could significantly damage the institution’s overall financial position.

**Creative Approaches to Resource Utilization**

An institution’s financial resources can provide further insight into the dangers, if any, it faces. A sample of 91 institutions with which we work reveals further behaviors of interest based on their access to resources. The chart on the left plots institutions with ample endowments, while the chart on the right represents schools with smaller capital resources.
Well-resourced institutions appear to exhibit relatively consistent responses to enrollment and space growth. But some of their less-well-resourced peers take a different, often riskier, response to enrollment trends.

- A conservative group is steadfastly refusing to invest heavily in new facilities in the face of enrollment growth, positioning themselves to use new tuition revenues to better utilize existing space for enhancement of curricular and student life experience. This is a wise approach if there is latent space capacity or new programs are less intensively using existing space. These institutions must take extra care observing the programmatic experience of students and faculty to make sure that quality is not impacted.

- A riskier group is growing as much as 50% in the face of much more modest or even declining enrollment. Initially, exposure to additional new program space will certainly be received well by the campus community. As these institutions invest in new space, they will need to protect against the risk that student enrollment will not fully utilize the space or imperiling the care and maintenance of existing spaces.

- A group we label as adventurous is growing significantly in both population and size. This balanced situation assures the overall educational experience is sustained or ideally improved by innovative new spaces. It remains to be seen whether the enrollment will be retained or if the population surges in these cases are temporary, eventually pushing these institutions down into the riskier group with significant underutilized space resources. Either way, these institutions are limiting capital available to address renewal and replacement need in existing spaces.
Lower Campus Age Hides Potential Risks

As we have touched on in past reports, two waves of construction over the past 50 years are placing tremendous stress on the ability of institutions to care for existing facilities while meeting the needs of evolving campus program demands. A first wave driven by GI Bill and Baby Boomer growth, representing 40% of the space on campuses, has been followed by a second wave of further enrollment growth and expanding program demands representing another 30% of campus space. The building system life cycle replacement demands of these two waves are not only coming due, but doing so simultaneously, expanding the pressure that all buildings place on owners as they age through their normal cycles.

As the average age of campus buildings grows, institutional leaders are in a race against time to keep up with the demands of existing space and renew the functionality and performance of the spaces used to educate students and sustain their academic and research missions. We routinely encourage campuses to assess the condition and effectiveness of their existing portfolio, investing where there is need and benefit. We also encourage campus leaders to seriously consider removing buildings from campus. Such a decision can take courage, especially when familiar and much-loved structures are at issue. An older campus presents more maintenance challenges and it may or may not be able to meet programmatic needs. But just how old a campus is and where to invest can be complicated questions to answer.

At Sightlines, we measure campus age not only by date of original construction, but also on the basis of the effective age of all buildings. This approach takes into account any substantial renovations that have restored the utility of older buildings in the portfolio. In 2007, the campus age of our database was 34.7 years. Had those buildings been allowed to age without attention, and with no new buildings built, the campus age would have grown to 44.7. In 2016, through a combination of new construction and renovation, the campus age in our database has in fact dropped half a year to 34.2, an encouraging trend. However, this data is a bit deceiving.
Closer inspection of the data reveals that 6.9 years of the age reduction is the result of new buildings constructed over that time. Only 2.6 years of that reduction is through substantial renovation of existing buildings. This means that while all of these buildings are effectively 1-9 years of age by our measure of campus age, 72% of the reduction in campus age has come from new construction that has expanded the campus footprint.

The goal of reducing campus age in order to keep the cost of maintaining the campus as small as possible is distorted by the addition of new buildings. New construction expands the amount of space to be maintained while reducing the reach of maintenance dollars. If this expansion is matched by new revenue to support building care, then it is neutral to operating budgets. If it is not, this reduced campus age is still placing expanded stress on the operating budget. Either way, the lack of renovation upkeep is soon felt by students, faculty and staff who will find vastly different experiences using the amenities of newer buildings compared to older, even well maintained, buildings.

The impact of campus age is also felt keenly by administration in its impact on enrollment trends, which is one reason greater attention to facilities upkeep is critical. The initial appearance of a campus tells a story that resonates with and plays into the decision of applying students and faculty. The comfort buildings provide plays a pivotal role in students’ and staff’s experience of a campus. Meeting these expectations isn’t simply about recruiting the numbers to remain financially sustainable. These institutions provide an essential service and if they aren’t able to meet the demands of students—either basic demands such as comfortable rooms or higher expectations for technology offerings—then institutions will not accomplish their mission. The building experience may not consciously be a driving part of staff or students’ decision to settle on a campus—until discrepancies across campus, or across schools, becomes too big to ignore.
**Investment Impact is Diminishing**

With building systems and components from those “first wave” buildings dating to the 1960s and ’70s, mentioned earlier, reaching the end of their useful life and the “second wave” buildings of the construction boom in the 2000s beginning to demand capital investments, institutions are facing record amounts of capital needs. These needs are only going to grow in the near term. How campuses prioritize finite capital resources between these two competing areas of campus will have a significant impact on their financial position for years to come.

The renovation age of existing buildings recognizes the renewal by comprehensive renovation of existing structures on campus. Broken up into sub-categories, a campus portfolio can be understood in greater detail:

- Under 10 years
- 10-25 years
- 25-50 years
- Over 50 years

For our database as a whole, we are watching growth in the categories of buildings 10-25 and over 50 years old, which corresponds with the two waves of construction noted above.
When examining campus needs, it’s important to remember that all facilities needs are not the same. **Current Needs** represent the work that should be done today and is necessary to keep buildings operational and attractive to staff and students: leaky roofs and building envelopes, mechanical systems that are in failure, old and shabby interior finishes, and so on. **Renewal Needs** represent keep-up work that will come due over the next 1-10 years and warrants planning. Not surprisingly, the largest amount of work (as shown in the next chart) exists within older buildings on campus and is coincident with the first wave of construction activity.

![Capital Needs chart](chart)

Less intuitive is the large amount of renewal need coming due in the 10- to 25-year-old buildings, a need larger than in any other class of building and about the same value as the current need in the over 50 buildings. The “hidden” demand of this second wave of construction will become pressing sooner rather than later. Importantly, in today’s more technologically advanced buildings, which create higher expectations, there will be less functional or customer tolerance for failing systems.

**Investment Lagging Need**

Many institutions are recognizing this expanding need and, since the downturn of 2008-09, have been increasing maintenance budgets to tackle the challenge. In fact, even in the face of tremendous space growth to match enrollment growth, facilities funding at research institutions is up 14%. While overall facilities funding levels are down from the 2007-2009 window where resources often effectively met need, funding at baccalaureate and master’s institutions has in recent years been on the rise.
But the challenge of time confronts all institutions. The renewal and replacement need from campus buildings as represented by the Sightlines Annual Investment Target, customized for each campus and aggregated here across our entire database, has grown over the last decade. Ongoing underinvestment coupled with campus expansions has meant the need for renewal and replacement dollars continues to outpace availability. Even with expansion of commitments to attend to building needs, the trend moving forward has been that campus improvements lag ever further behind.

Examining a subset (approx. 1/3) of our member campuses that are looking forward, we've developed a more detailed profile of need over the next ten years. That picture, below, is not encouraging.
These data reframe the impending second wave renewal need highlighted earlier, and they show that all classifications of schools will face budget challenges.

Recommendations
What’s clearest from this picture is that institutions must make tough decisions about which projects need attention and then develop creative solutions to close the gap between current needs and available funding. Among institutions we see innovating in this area, effective solutions include the following elements:

• **Invest with space utilization in mind.** Target investments that improve the utilization of existing space. There is no better way to reduce growth pressure than by limiting footprint growth and maximizing the resources at hand.

• **Coordinate to create investment “win-wins.”** When facilities managers combine their renewal investments with program modernization, each department is more likely to reach their goals and spend more efficiently. An additional benefit is that this collaboration can build long-term relationships that help facilities managers demonstrate the value their department contributes to the institution’s overall success.

• **Maximize the impact of each investment.** Connecting facilities investment with broader university priorities increases value through expenditures directed to the pieces of the campus portfolio most critical to mission success.

• **Plan for where not to spend future capital.** Institutions may need to make tough decisions about buildings whose condition does not warrant additional investments. Identify transitional space for intentional deferral and, most importantly, communicate this to the campus community.
Operations

Budgets are impacting service

Although the amount and complexity of space has grown, operations resources have not increased to meet these demands, affecting service levels. As operational challenges only increase with “second wave” space aging, institutional and facilities leadership face significant questions regarding how to maintain adequate service levels or manage the consequences.

It is no surprise to facilities leaders or their colleagues in finance that facilities budgets have been under stress. The ten-year view shows that database operating budgets that were (on average) $5.51 in 2007 had risen to $5.94 in 2016, a nearly 8% increase.

![Facilities Operating Budget](image)

The challenge is that CPI-U as reported by the federal government over that time has grown nearly 15.5%. While CPI, like all such indexes, is an imperfect baseline metric, an inflation rate double that of operating budget increases is an undeniable red flag. Years of flat or declining budgets have had a significant impact on the capacity, as well as the motivation, of operating organizations. No matter how optimistic one might be about 2017 data, returning to the funding levels of 10 years ago is a steep climb and not likely to happen any time soon.

These conditions have generated a range of responses. Reactions to reduced budgetary capacity have included level funded equipment budgets and greater pressure on energy use. In many cases, institutions that reduced staff following the start of the recession never restored those positions, and in some cases staff reductions have continued.
Facilities organizations measure this staffing condition in terms of coverage, the area that is being cared for per full-time employee. Increased coverage means an employee is responsible for a larger portion of the campus and has less time to attend to any particular area or system component. Decreasing coverage means the reverse. As indicated in the following chart, maintenance coverage has expanded since 2007 for both public and private institutions.

![Maintenance Coverage Chart]

In 2007, both categories averaged about 84 thousand square feet per employee. Private schools have seen that number expand to nearly 88 thousand by 2016, though coverage has actually improved in this category since 2014. Public institutions, on the other hand, are approaching 97.5 thousand square feet per employee, with coverage increasing notably in the past few years. Public institution employees are now caring for nearly 11% more space than their private school brethren. Maintenance staffing is an interesting measure in this regard because, while one might argue that private school students and faculty receive a different standard of care, the equipment serving those institutions is equivalent in the maintenance cycles and needs.

Technology and new management techniques introduced in recent years have produced new methods and efficiencies. These tools and techniques partly explain expanding coverage areas, but the recent strong divergence between public and private institutions gives us pause. At the very least, this is an area for short- and long-term attention.

The response to these trends has been a series of innovations that are worth exploring.

As evident in the first graph below, the years immediately following the financial downturn saw a trend toward more effective use of existing computerized maintenance management tools. We witnessed a strong 5% uptick in our Service Process Index, which measures how effectively an organization leverages its people and systems. Faced with staff reductions, many institutions had to find ways to optimize their existing systems. The result was improved service and departmental efficiencies—but not a return to “normal.”
As the old standard of “normal” continues to look like a distant future, some institutions are embracing interesting and strategic organizational changes.

Over the past 10 years there has been a 5% increase in the number of mechanical trades staff as a percentage of total maintenance staff. While underinvestment in all maintenance areas presents potentially grave risk, this trend reflects interest in these complicated systems, where failures can be especially problematic.

Maintenance supervision, or the number of people being supervised, is another area of interesting change. The past several years has shown a more than 5% reduction in the number of employees being managed. Maintenance supervision, close to the work and well informed about key campus issues, is essential to making the best possible decisions.

Combined, these trends speak to innovations that are being incorporated into the facilities organizations going forward, as there is little indication that a strong reversal in investment in institutional operating budgets is likely any time soon.

Coverage expansion in the custodial area has also grown, but with much less divergence, as private schools catch up to public colleges and universities. Private custodial coverage has grown 14% since 2007, nearly twice the rate of publics, and at this pace will catch up in another ten years.
In existing spaces, these data most likely indicate a reduction in customization and acceptance of new standards of service and care. Where there is new construction, this may represent efficiencies borne out of technology and design changes that enhance durability and accelerate cleaning processes.

Intriguingly, institutions don’t extend this coverage expansion trend to their landscape programs. Whether it is a reflection of the importance of positive first impressions to recruiting, the need to maintain a solid relationship with the community, or the fact that landscaping is a relatively inexpensive place to invest operating dollars, grounds coverage areas have not only not increased, they have decreased 3-4% over the past decade.

As an example of matching investment priorities to return on investment, this will continue to be an interesting area to watch.
Recommendations

Maintaining the level of service that higher education institutions have provided historically is going to require creativity. Colleges and universities ready to invest in their facilities should first examine the factors influencing investment decisions and then consider how resources might be deployed to maximize the operational budget. Effective strategies have included the following measures:

- **Understand the drivers of operational costs.** Numerous factors such as growing backlogs, increasing technical complexity, or student density may contribute to rising facility demands. By recognizing these drivers, institutions can better direct resources.

- **Learn how technology can mitigate demands.** Investing in solutions such as building automation and adaptive planned/predictive maintenance systems can help facilities managers streamline processes and attend to facility needs before they become critical—and exponentially more expensive. But even simple solutions, such as improved reporting from CMMS, can help facilities proactively address challenges.

- **Rethink organizational structure and processes.** Having the right staffing skill mix and effective scheduling process can dramatically increase efficiency and improve communication with the customer.

- **Communicate with the campus community to manage expectations.** Establish an understanding of service standards throughout the community. Ensuring that campus partners understand facilities department constraints can contribute to more open discussions and potentially build beneficial relationships across the campus.
Strategies for Success

The challenges with which we have become all too familiar in recent editions of this report continue to loom over higher education facilities management—a constant caution that these departments must lead change to remain effective. These challenges include the following:

- Coinciding expenses related to two waves of new construction over the past 50 years challenge all institutions to closely examine their investment strategies.
- Space growth continues to outpace enrollment growth at many institutions, creating risky financial commitments for the near- and long-term future.
- Investment continues to have a declining impact as the demands of new and existing space pushes needs beyond even the most aggressive funding growth.
- Renewal needs coming due over the next 10 years will only add to the pressure facing facilities and finance offices.
- As budgets continue to lag inflation, operators are evolving coverage and staffing strategies to address ever-expanding coverage responsibilities.

As we described last year, building failures and serious facility problems remain infrequent despite these challenges. This is in part because the robust amount of new space on some campuses provides flexibility. In addition, we are witnessing new strategies being used to respond to the current environment.

Among these strategies, some of the most important include:

- **Maximize investment return by:**
  - Investing with space utilization in mind
  - Connecting renewal to modernization
  - Investing to reduce current costs
- **Champion not investing, if investments will conflict with maximizing return**
- **Organize strategically to optimize service effectiveness and operating efficiency**

Finally, every campus we see successfully tackling these challenges analyzes their data and utilizes comparative metrics to track performance, communicate accomplishments, and articulate needs to the community or leadership.
Where do we go from here?

Since the recession, public and private colleges and universities have found ways to stave off critical facilities needs and even grow their footprints to compete with similarly growing peers. But the savviest institutions among these recognize that at some point the demanding combination of managing more space with fewer resources will impact the institution’s overall recruitment and retention goals.

Faced with this new reality, many higher education institutions’ facilities departments have made headway in addressing these challenges using innovative strategies to better utilize their existing space and maximize the return on every capital and operational investment.

During discussions with facilities and finance professionals at hundreds of colleges and universities each year, Sightlines has seen some schools address the challenges with innovation, optimized resource utilization, and conservative budget management.

Those campuses that most successfully address these challenges rely on data analysis to gain a deeper understanding of their facilities and compare their situation to their institutional peers. By paying attention to performance metrics, these facilities departments are able to demonstrate how they’re building value — and secure funding for projects that support the institution’s mission.

Savvy decision-makers will take a holistic view of the resources at hand and work within realistic enrollment and investment goals without losing sight of their institution’s mission. Colleges and universities that invest wisely in facilities over the long term will produce a campus that addresses the needs of students and faculty, impresses prospective students, and is financially sound—without undue risk.
Sightlines, a Gordian Company, is a leader in helping colleges and universities better manage their facilities operations and capital investments. Sightlines provides tools for strategic planning, analyzing and benchmarking that generate an independent, reliable comparison of campus performance in these areas against peer institutions.

Using its unique, proprietary Facilities Benchmarking & Analysis process, Sightlines visits each campus annually to collect more than 200 indicators of facilities and financial data and then identifies trends and provides useful analysis and benchmarks. With Sightlines, institutions receive the context and validation they need to make sound, clear, informed and financially credible decisions about campus facilities. As a result, campuses can optimize capital investments, address backlog of deferred maintenance projects, develop a strategy to steward physical assets, improve the effectiveness of facility operations, reduce energy consumption and better serve students, faculty, staff, and visitors.