Sightlines, LLC
Return on Physical Assets (ROPA℠) Annual Update
Kansas State University

FY2005 – FY2011

Sightlines

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Overview

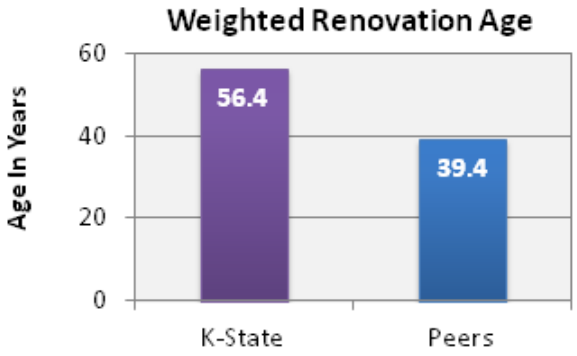
Sightlines, LLC has been working with Kansas State University since May of 2010 and has since compiled seven years of annual data for state supported space on the Manhattan and Veterinary Medicine campus. Sightlines quantified the data presented within this report by a site visit to Kansas State University. Once collected, the data was both verified as accurate and qualified to ensure comparability and accuracy. Additionally, the information has been analyzed in terms of progress toward goals and objectives defined jointly between Kansas State University and Sightlines, and fairly present the operations and capital portfolio for the university. (For a list of peer institutions used within this report, please see Appendix I).

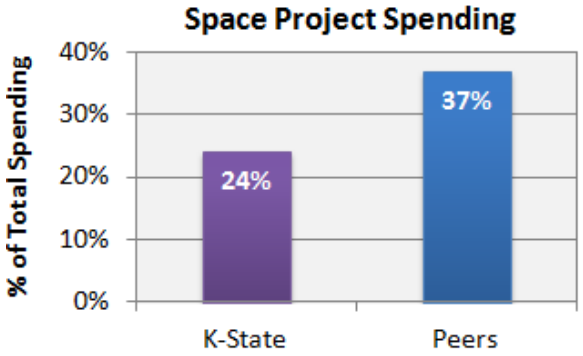
Section I: Institutional Findings

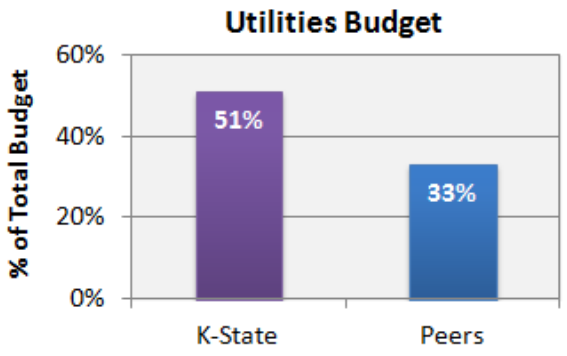
Core Issues:

There are three major issues impacting the physical assets of Kansas State University in FY2011:

- **Age of space**: With no record of major renovations being done on campus, 90% of space is now over twenty five years old making K-State the oldest campus among its peers. Reaching twenty five years old is a critical age in a building's lifecycle as it is the threshold when many major building components begin requiring capital investment.
- **Capital investment**: While total capital investment has increased significantly over time in order to cope with increased need, there has been a lack of historical capital investment. Spending has been concentrated on envelope/mechanical types of projects leaving limited funding for space/programming types of projects.
- **Operations Profile**: While total daily operating costs are near the peer average, K-State is spending more on utilities, leaving less funding for daily service and planned maintenance work. Despite limited funding, Division of Facilities is providing results comparable to peer institutions as evidenced in the campus inspection results.







Key Recommendations:

- Considering the "K-State 2025" vision, it is important to address the age of space on campus to remain competitive and gain standing in the top 50 research institutions.
- While capital funding has grown to meet the peer average in FY11, K-State has seen limited capital investment historically. This, paired with an older and aging campus, has lead to a growing backlog of reinvestment need which is likely much higher than the current in-house study reflects. Updating the backlog study will provide the university with a tool to guide capital investment toward the areas of highest need.
- With available capital, K-State has done a good job with concentrating on envelope/mechanical types of projects which have a larger impact on extending the life of spaces on campus. However, in doing so, K-State has fallen behind in modernizing programmatic spaces. Be mindful of the implications a lack of space/program investment can bring. Underfunding has likely led to a misalignment of available spaces and program demands.
- Older, less efficient spaces on campus have lead to K-State consuming more energy than peers. Due to the high energy consumption, 51% of K-State's operating budget is spent on utilities, leaving fewer funds available for day-to-day campus operations. Addressing the age of space and increasing the efficiency of spaces on campus can free up operational resources to be redistributed toward planned maintenance funding.
- Division of Facilities is often doing more with fewer resources than peers. While achieving favorable results, effectiveness is impacted by the age of campus, limited daily service budget dollars and planned maintenance due to high utility expenses. Work to reduce energy consumption and reallocate any released budget dollars toward planned maintenance.

Section II: Supporting Analysis

Sightlines, LLC conducts its analysis of institutions' physical assets in the framework of 4 major axes: Annual Stewardship, Asset Reinvestment, Operating Effectiveness, and Service. Although each axis will highlight specific areas of physical asset management for which Division of Facilities is responsible, the components are heavily interrelated and thus any major change in one area has a corresponding effect on another. The core issues presented below incorporate areas of focus from each of these axes (please see appendices for detailed explanations of the four axes).

Understanding campus age: Age is the driving factor of many capital and operational stressors at Kansas State University. Since 2005, there have been no major changes to the space profile at K-State and as a result space has continued to age on a linear trajectory. In FY2011, 90% of space at K-State is over 25 years old. Not only is a majority of space older than 25 years, but the average age of each square foot of space on campus is over 56 years, making K-State the oldest school among its peers (who are 39 years old on average) and the second oldest school among the top 50 research institutions within Sightlines' database. ***See figure 1.***

Impact of age on capital demands: The 25-year old mark in the life of a building signifies a threshold when major building components begin to reach the end of their useful life. Extending the useful life of these components and keeping up with system failures requires significant investment of capital resources. Over the last seven years, Kansas State has

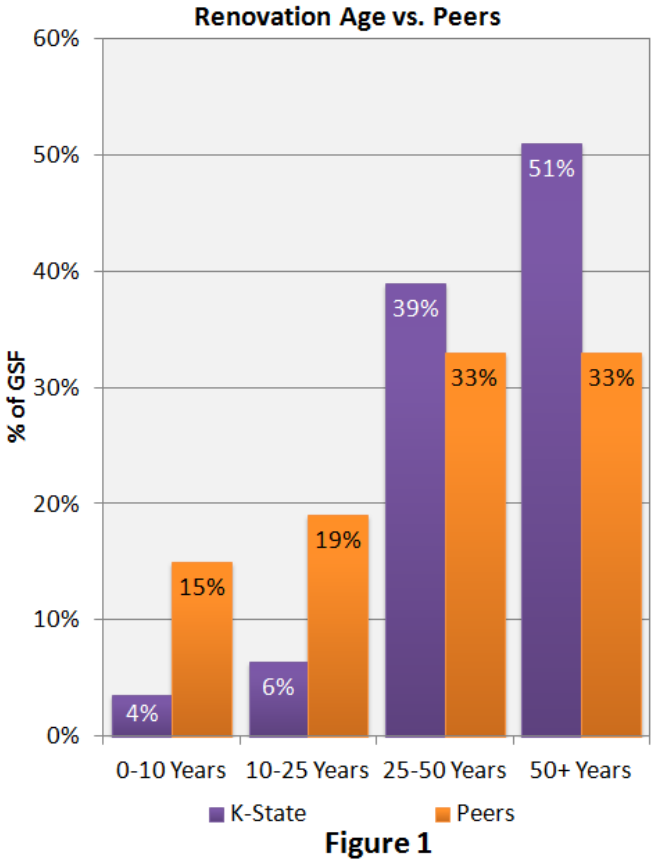


Figure 1

ramped up capital spending to address these needs on campus. Spending has risen from $0.51/GSF in FY2005 to $4.50/GSF in FY2011, an 800% increase. While the increase is significant, it is important to note that the additional capital resources have not set Kansas State apart from peers. They have merely brought the university up to peer average levels in FY2011. A history of limited capital investment has led to the accumulation of a backlog of deferred maintenance need. Deferred maintenance need paired with modernization need due to the age of space and infrastructure need creates a holistic look at the total capital reinvestment demands on campus. At K-State, Sightlines estimates the total backlog is likely $110/GSF, this is based on age using parameters set by backlog studies that Sightlines has conducted on other college and university campuses nationwide. ***See figure 2.***

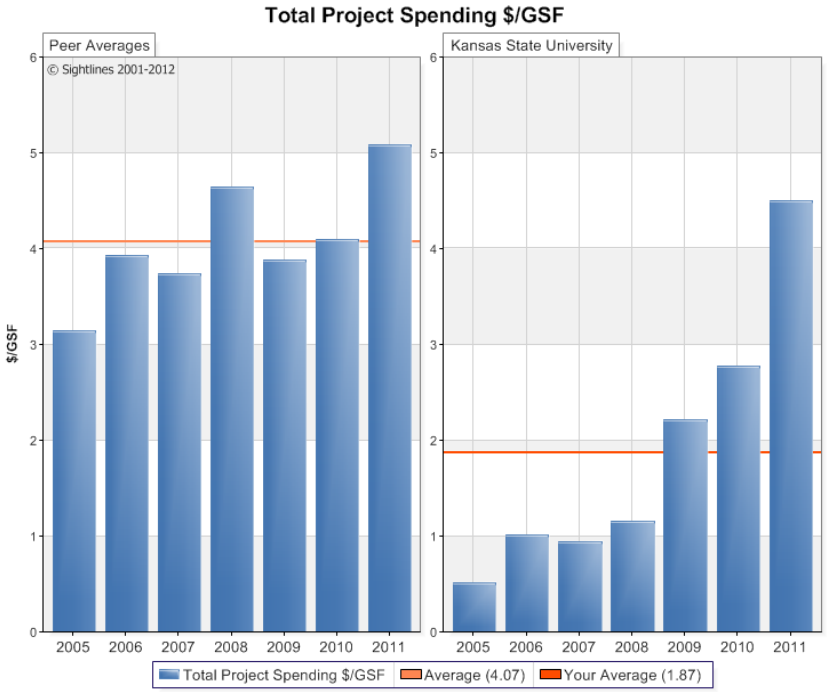


Figure 2

Impact of age on institutional programs: The increase in capital spending has been largely due to failing systems and state stimulus funding earmarked for the envelope and mechanical needs of campus spaces. 76% of capital investment in the last seven years has been spent on envelope and mechanical types of projects leaving just 24% of funding for space and programming need. Considering the age and capital profiles of Kansas State University, it is likely that spaces available are out of alignment with institutional program needs. With space that is nearing 60 years old and limited funding to update that space, the classroom size and technology within those classrooms are outdated. At Kansas State the average capacity of a general use classroom is 58.4 seats and 85% of classrooms hold 30 or more seats. According to the common data set, 72% of classes scheduled have fewer than 30 students enrolled while only 15% of classrooms have a corresponding capacity. While it is immediately apparent that appropriately sized classrooms can be utilized more efficiently, the impact of limited technology is less apparent. Based on space utilization studies performed at other colleges and universities in Sightlines' database, findings show that classrooms with higher levels of technology are typically more highly utilized. At Kansas State, only 6% of general use classrooms are considered to have a high technology score. A combination of wrongly sized classrooms and limited technology within those classrooms may be negatively impacting institutional programs and the utilization of space at Kansas State University. ***See figure 3.***

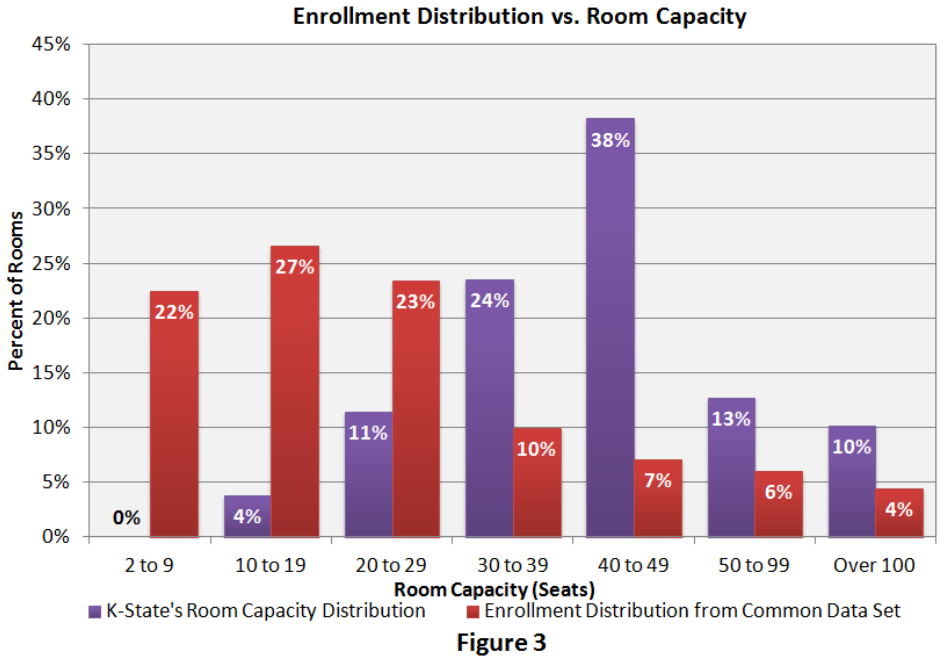


Figure 3

Impact of age on operational demands: There is a unique mix of form and function at Kansas State University. Even though campus is so old, nearly 50% of the total GSF is dedicated Science Research space in accordance with the "K-State 2025" vision to be a top 50 research institution in the United States. High intensity programs inside of old, inefficient building shells are contributing to energy consumption at K-State that is nearly 40% higher than the peer average in FY11. Such high energy consumption is requiring K-State to allocate 51% of the facilities operating budget to utilities while peers are allocating only 33% to utilities. This leaves K-State with $0.76/GSF less for daily operating resources compared to peers, which is a large difference considering the total operating resources for K-State are $2.96/GSF (excluding utilities). ***See figures 4.***

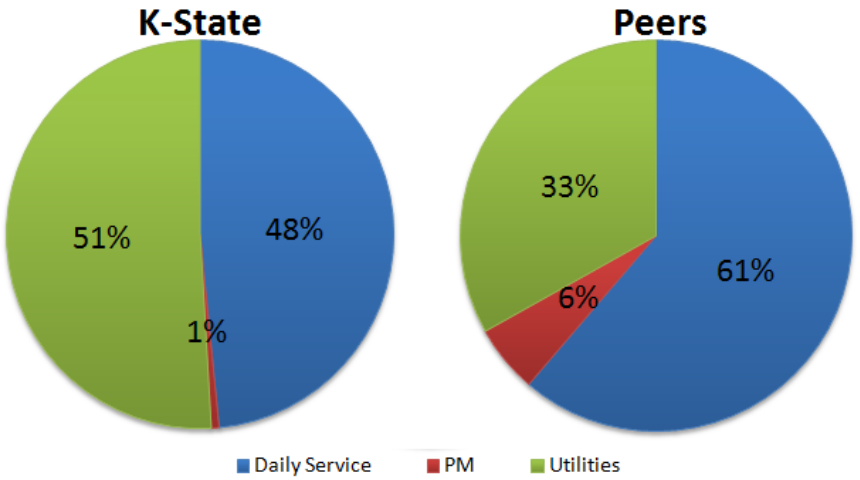


Figure 4

Closing Comments

As the economic atmosphere in higher education remains cautious, strategic and targeted project selection has become even more important. At Kansas State the importance of project selection is heightened by an old, continually aging campus profile and a lack of historic project spending. An updated, comprehensive backlog analysis will allow the university to record and prioritize all campus needs, integrating long-range capital plans with current investments. A backlog study can highlight economic opportunities on campus like energy conservation projects that will reduce consumption and payback the initial project cost. Operational funding for utility consumption freed up through capital investment can be redirected to areas of critical daily service needs such as planned maintenance.

Managing the allocation of resources will be particularly important at Kansas State as the University strives to meet the "K-State 2025" vision. As programs change and evolve, it is necessary that programmatic spaces change and evolve in conjunction. It is essential that Kansas State have a strong understanding of available physical resources in order to best align them with programmatic needs. A space utilization study can provide the information necessary to adapt current spaces on campus to new demands and increase the efficiency of space being used. This study can be paired with a backlog analysis to highlight needs that will have the largest, most immediate spatial and programmatic impact and ensure that institutional resources are used to reach the best outcome.

Appendix I – Peer Comparisons

The following institutions have been determined as a representative peer comparison group based upon size, complexity, age, status as a land-grant institution, status as a Top 50 Research institution and membership of the Big 12 Conference.

- Clemson University+~
- Iowa State University*+~
- Michigan State University+~
- Oregon State University+
- Purdue University+~
- Texas A&M University*+~
- The Ohio State University+~
- The Pennsylvania State University+~
- The University of Mississippi+
- The University of Oklahoma*
- University of Arkansas+
- University of Colorado – Boulder~
- University of Illinois - Urbana/Champaign+~
- University of Missouri – Columbia*~
- West Virginia University+

*Member of the Big 12 conference

+Land-grant institution (as designated by state legislature)

~Top 50 Research Institution (as designated by *The Center for Measuring University Performance*)

Appendix II – Annual Stewardship

The annual facilities stewardship metric demonstrates a campus's ability to preserve its physical assets. The gap between the annual need and actual funding determines an institution's deterioration rate. This is a long-term indicator of financial and operational performance, however most institutions lack the measurement tools to quantify it. The ***ROPA^{SM}*** model utilizes the following metrics to quantify the draw on physical assets.

Envelope & Mechanical Systems Maintenance

Envelope & Mechanical Maintenance, defined as the "hard" maintenance needs of a building, assures the replacement of key building components as they reach the end of their useful life. These components include such basic items as the roof, windows, doors, pointing, boilers, chillers, piping, and electrical service. The total cycle maintenance need is calculated based on the technical complexity of each building. The actual investment is readily assembled by the review of operating and capital budget expenditures for each year. The difference between the annual need and the actual annual investment defines the envelope/mechanical deferral for a given year. This list of deferred needs adds to the asset reinvestment backlog.

Space and Program Renewal

The space and program need, in contrast to cycle maintenance needs, are the "soft" renewal requirements of a building that assure the interior space supports the program housed within a given facility. These components include such items as finishes, furnishings, fixed equipment, space layout, and the support systems to provide electricity, air movement, heating and cooling. The total space and program need is based on the technical complexity, age, and function of each building. The actual investment is extracted from the operating and capital expenditures for each year. The difference between the annual need and the actual spending defines the amount of space/program needs deferred and subsequently added to the asset reinvestment backlog each year.

Appendix III – Asset Reinvestment

The asset reinvestment dimension quantifies a campus's backlog of maintenance/repair, modernization and infrastructure needs and its demonstrated capacity to address them. The first component is the value of the entire inventory of these deferred needs, or backlog. From the priorities assigned to each item in this inventory comes the value of the top priority items, and the associated time frame within which they are to be performed.

The Asset Reinvestment quadrant of the model only addresses the need of, and the investments in, existing facilities. The cost to construct new facilities is not factored into the asset reinvestment analysis. The campus's one-time capital investments in existing facilities (excluding investments from operating and recurring capital funds) over the previous three years are reviewed, averaged (to establish an annual asset reinvestment rate), and projected over the same number of years estimated for the top priority projects. This projection compared to the value of this priority backlog of needs in that same time frame determines if the current asset reinvestment rate will meet, exceed, or fall short of funding the campus's top priority deferred maintenance and modernization needs. (Operating funds investments in preventive and planned maintenance and recurring capital funds investments in capital renewal projects are excluded from asset reinvestment consideration because while they add value to, extend, or maintain the useful lives of existing components, they do not eliminate deferred maintenance backlogs).

Appendix IV – Operating Effectiveness

Traditional facilities benchmarking efforts have generally focused on operating cost and consumption statistics. While these benchmarks are valuable in providing a context from which to assess performance, their utility is limited because they are not reconciled to institutional mission and organizational goals. The ***ROPA***^{SM} model incorporates mission and goals, with its benchmarks as a way of understanding the trade-offs between service, operating processes, asset reinvestment, and annual stewardship.

Operating Budget Analysis

Facilities budgets are composed of daily services, preventive maintenance, and utilities. Illustrating the distribution of these costs is helpful in guiding the operational focus within the facilities organization. The ***ROPA***^{SM} model evaluates these budgets by creating a matrix of expenditure blocks (salaries and wages, benefits, expenses, utilities, equipment and income) to ascertain the "gross" maintenance expenditures, and expenditure programs – daily service, planned maintenance (Planned projects and preventive maintenance on equipment), and utilities. (Non-facilities items such as security, mail service, and motor pools are excluded.)

Energy Cost and Consumption

Large portions of facilities budgets are dedicated to utilities. Evaluating the dollars spent per unit of energy, as well as actual energy consumed, is invaluable in making decisions regarding the procurement of fuel, new equipment, and even new facilities.

Operations Performance

This series of measures is a guide to the management of facilities departments when properly reconciled with institutional mission. The ***ROPA***^{SM} model uses metrics of staffing per gross square foot, materials per FTE, workers per supervisor, and work order production to illustrate operating effectiveness. These factors become invaluable performance measurements over time.

Appendix V – Service

The service evaluation scale measures the quality of service delivery as perceived by the customer. This scale is a composite of three indices: *Service Process Review*, *Space Inspection, and Customer Satisfaction.* From the assembled information, discussions and a review of a sample of facilities, assigned scores are summarized in the following manner.

1. **Service Process:**
   a. Centralization of Customer Service Requests
   b. Scheduling Process Division – What & When vs. Who & How
   c. Organizational Structure and Position
   d. Work Order System – Overall capabilities
   e. Performance Measurement – Backlog, Schedule, Dates, Repeats, …
2. **Campus Inspection:**
   a. Cleanliness
   b. General Repair
   c. Mechanical Systems
   d. Facility Exterior
   e. Grounds
3. **Customer Satisfaction:**
   a. Knowledge/Understanding of Process
   b. Schedules and Service Levels
   c. Work Meets Expectations
   d. Feedback Opportunity
   e. General Satisfaction with Service

Appendix VI – Sightlines Member Website

Sightlines 4.0 is the new and improved version of the Sightlines member website. Its great new features and enhancements make it easier to turn Data into Information and harness the Knowledge to take Action. A more powerful and user-friendly interface along with a simpler and more intuitive benchmarking engine provides Sightlines members with even faster access to comparative data. Choose your metrics and manage your comparative groups with ease.

Here are just a few of the new enhancements:

- **Improved Design and Navigation** — Our new layout is easier to read, navigate, and adjust to accommodate any screen size.
- **New Benchmarking Process** — An entirely new benchmarking process makes it easier to generate comparisons. You'll be able to manage comparative groups and download data with greater control and fewer clicks. The new user interface provides easy access to benchmarks, longitudinal performance metrics, and deliverables, all in one central location.
- **Member Forum** — Don't feel like you're alone in the process of facility improvement. Chat with colleagues and ask questions in our new Member Forum — a great way to improve your knowledge of specific issues and problems occurring nationwide.

As always, Sightlines members will continue to enjoy access to the largest verified database of facilities metrics in the country. Our QVQ Process (Quantify, Verify, and Qualify) ensures consistent analysis and comparable benchmarking.