Facility Condition Assessment & Space Study Project

KRS 164 / M-05468008

Final Report

Eastern Kentucky University

Submitted by:

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Paulien & Associates
NCHEMS

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Kentucky Postsecondary Education System
Eastern Kentucky University
Facility Condition Assessment & Space Study

February, 2007
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Note on Figure and Table Headings: Figures and Tables are numbered sequentially as if both illustrations were part of the same list. i.e. Figure 1.3 may be followed by Table 1.4, without there being a Table 1.3.

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Eastern Kentucky University

Part II. A.

Eastern Kentucky University

Richmond, Kentucky
Joanne K. Glasser, President
James Street, Director of Facilities

Section 1. Introduction

The Kentucky Council on Postsecondary Education (CPE) contracted with Vanderweil Facility Advisors, Inc. (VFA) to assess the condition, space adequacy and space capacity of selected facilities at Kentucky's nine public higher education institutions during the summer and fall of 2006. The studies are intended to inform both the Council and the institutions as the basis for a 15-year capital plan that would help address the following important questions:

- What is the condition of each institution's facilities? What system renewals are due for those facilities, both deferred renewals due today and future renewals due within the next 15 years?
- Is the current space (in selected buildings) fit for continued use? If not, how much would it cost to upgrade those buildings?
- Does each institution have enough space, now and to meet enrollment projections for the year 2020? If not, how much will it cost to add the needed space?
- How do Kentucky facilities compare to other postsecondary educational portfolios?
- Is there evidence to indicate why the predicted capital reinvestment is needed?
- What recommendations does the project team have as KPES creates a 15 year capital plan for facilities?

Summary of Findings Figures:

Figure 1.1: EKU 15-Year System Renewal Needs

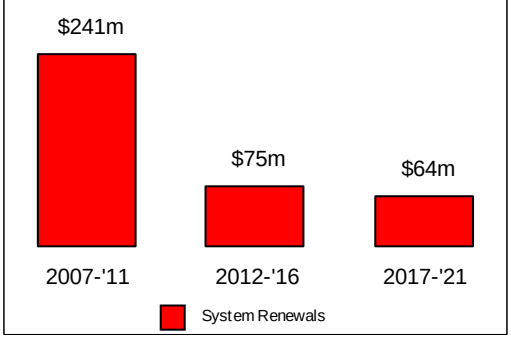


Figure 1.2: EKU 15-Year Space Adequacy + Capacity Needs

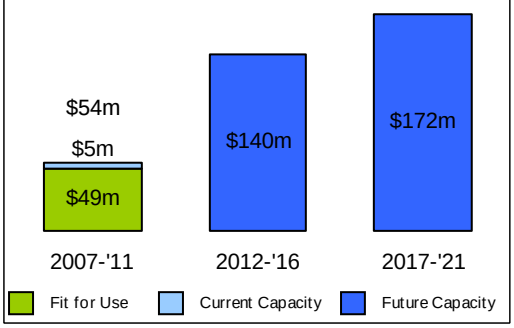
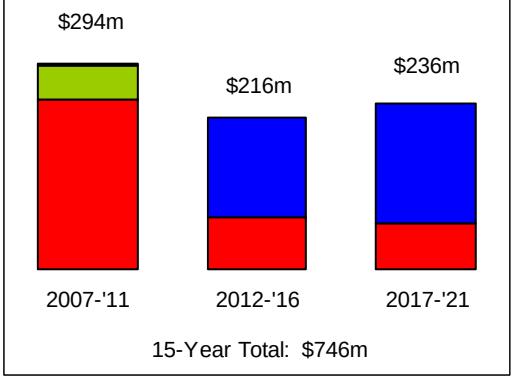


Figure 1.3: EKU 15-Year Blended Needs



LEGEND: Colors in Figure 1.3 correspond to labels in Figures 1.1 & 1.2. Figure 1.3 summarizes the annual needs presented in Figure 6.4.

Attributions:
All sections of this report are by Peter Scanlon, Thomas Bart and Joseph Maggiore of VFA, Inc., unless otherwise noted under the Section heading.

Table 1.4: Percentage of Institutional Portfolios Included in Study

	Institutions' Portfolios*		Condition Assessment by VFA**				Space Adequacy Study by Paulien			
Institution	Total # of Buildings	Gross Square Ft	Total # of Buildings		Gross Square Ft		Total # of Buildings		Gross Square Ft	
Eastern Kentucky University	190	4,626,458	55	(29%)	2,829,774	(61%)	10	(5%)	867,593	(19%)
KCTCS	284	6,138,142	198	(70%)	5,740,720	(94%)	8	(3%)	509,813	(8%)
Kentucky State University	54	1,223,473	37	(69%)	726,963	(59%)	7	(13%)	148,841	(12%)
Morehead State University	112	2,718,050	39	(35%)	1,556,012	(57%)	11	(10%)	813,450	(30%)
Murray State University	169	3,710,171	48	(28%)	2,453,372	(66%)	3	(2%)	203,667	(5%)
Northern Kentucky University	109	2,440,541	26	(24%)	1,558,254	(64%)	5	(5%)	649,987	(27%)
University of Kentucky	908	14,884,891	167	(18%)	8,700,858	(58%)	51	(6%)	3,564,946	(24%)
University of Louisville	136	7,889,007	107	(79%)	4,513,765	(57%)	36	(26%)	2,469,961	(31%)
Western Kentucky University **	54	4,266,565	40	(74%)	1,860,621	(44%)	10	(19%)	809,809	(19%)
Total	2,016	47,897,298	717	(36%)	29,940,339	(63%)	141	(7%)	10,038,067	(21%)

*Source: Fall 2005 Building Data Base submission.
**Space assessed by VFA is Education and General Space.
***Revised to include WKU housing facilities.

Summary of Findings:

- The present study examined only a portion of Eastern Kentucky University's (EKU) portfolio (55 of 190 buildings (29%) for condition study and 10 of 190 buildings (5%) for space study). The results of the present study most likely understate the amount of capital investment needed.
- EKU facilities included in the study require $241 million in system renewals during 2007-2011, and $139 million more between 2012 and 2022, totaling $380 million in system renewals over 15 years. (Figure 1.1 and Section 4.)
- EKU facilities included in the space fit-for-continued use study require $49 million between 2007 and 2011 to bring them up to current educational adequacy standards. (Figure 1.2 and Section 5.)
- EKU facilities require $5 million between 2007 and 2011, to meet current enrollment needs, and an additional $312 million over the following 10 years to meet future enrollment projections. (Figure 1.2 and Section 5.)
- For facilities included in the study, the total 15-year capital investment required to address condition, adequacy and capacity is $746 million. (Figure 1.3 and Section 6.)
- Eastern Kentucky University compares unfavorably (35% 5-year Facility Condition Index) to the benchmark higher education institution's portfolio (18% 5-year FCI). (Section 4.)
- The condition of facilities EKU is generally consistent with the age and construction methods of the facilities. There are many major system renewals due because 73% of EKU buildings were built over 30 years ago, and as would be expected, many systems are at the end (or beyond the end) of their expected useful life. (Section 4.)
- The project team recommends CPE and EKU address all three needs (condition, adequacy and capacity) with blended investments to address them simultaneously, staged over 15 years. (Section 6.)
- Funding options for EKU to consider vary according to the type of facility: The "cleanest" approach to funding the backlog of deferred renewals would be a state bond issue paid from general operating revenues, together with a requirement that each institution spend an amount equal to the GASB recommended depreciation amount. New construction of auxiliary facilities is most often funded with long term debt supported by student direct use charges. The predominant funders of general academic facilities—classrooms, labs, offices, and libraries—are state and local governments (direct appropriations or debt) and private donors (outright gifts). The primary funders of research facilities are state and federal governments and private donors (either individuals or philanthropic organizations). (Table 1.5 below, and Section 7.)

Table 1.5 below (a copy of Table 7.3 in Section 7) is presented as a worksheet for KPES.

Here, the subtotals of the "Strategic Funding" scenario suggested in Section 6.8 are shown in the "Amount Needed, from 2006 Study" column. (The total amount needed, $677m, is less than the $746m shown in Figure 1.3 because the recommended "strategic funding" leaves a small, usually acceptable (10%), portion of the deferred renewals undone.)

KPES and EKU policy makers can use Table 1.5 as a framework to allocate the Amounts Needed across the most likely sources of funds to create KPES' 15 Year Funding Plan.

If KPES and EKU choose to supplement this study with additional information, any additional capital investments identified would need to be included.

TABLE 1.5
EKU Funding Patterns Worksheet for Higher Education Facilities

USES		SOURCES					
	Amount Needed, from 2006 Study	Students	State	Local Govt.	Federal Govt.	Donors	Institutional Funds
Renewal and Renovation							
• Condition/End of Life	$311m		Approp./debt				Approp./debt
• Space Adequacy	$48m		Approp./debt				Approp./debt
New Construction							
• Auxiliary	n/a						
2006 Capacity							
• Academic facilities	$5m	Fees	Approp./debt	Debt		Gifts	Lease/ purchase
• Research facilities	$0m		Approp./debt		Grants	Gifts	
2020 Capacity							
• Academic facilities	$312m	Fees	Approp./debt	Debt		Gifts	Lease/ purchase
• Research facilities	$0m		Approp./debt		Grants	Gifts	
TOTAL	$677m						

Figure 1.5 is a copy of Figure 7.3 in Section 7.

Section 2. Project Overview: Methodologies, Data, Outcome & Limitations

The nine institutions included in the study were:

- Eastern Kentucky University
- Kentucky Community & Technical College System
- Kentucky State University
- Morehead State University
- Murray State University
- Northern Kentucky University
- University of Kentucky
- University of Louisville
- Western Kentucky University

The study includes selected buildings identified by CPE as education and general space on each institution's campus. In total, VFA performed a Level 1 Lifecycle Condition Assessment (LCA) of 55 assets at EKU comprising 2.8 million square feet (29% of 190 buildings; 61% of square footage in portfolio). Nearly 1.6 million square feet (39%) of institutional space was NOT included in the condition study. Also, VFA's project partner Paulien & Associates was asked to examine the space adequacy of 10 education and general buildings selected from various campuses (only 5% of 190 buildings in the portfolio), and evaluate the space capacity of each institution vs. current and future student populations.

The number of buildings and amount of space not included in the present study means the results of the study most likely understate the amount of capital investment needed at EKU.

Methodologies

In the Level 1 Lifecycle Condition Assessments, VFA facility experts profiled each asset's major building systems to assess the capital renewals required now and in the future. A renewal of a building system is defined as an investment required at the end of the system's useful life, to prolong, or renew, its service in the facility — for example, re-roofing a worn out old roof. "Deferred Renewals" are renewals that, based on the age of the facility, were due in the past, but have not yet been completed.

Each building's system lifecycle assessment included establishing a replacement value of each system, comparing the system's expected (industry standard) useful lifespan to its observed remaining life, and estimating the cost to renew that system when replacement is due. Replacement values (adjusted to reflect local market conditions) of each asset's component systems were then added together to establish an asset's replacement value, and the cost of system renewals due within the coming five years was summed. The ratio of these 5-year renewal costs divided by the replacement value of their asset(s) establishes an index, called a Facility Condition Index, which can be used to compare the relative condition of assets. Lower FCIs indicate an asset requires little renewal investment; buildings with higher FCIs are in worse shape. Lower FCIs are better.

$$FCI = \frac{\text{[Sum of 5-year Renewals]}}{\text{[Replacement Value of Asset(s)]}}$$

The LCA process and methodology is supported by the expert opinions of facilities engineers and architects, along with VFA's web-based capital planning software application, VFA.facility. Condition data about each facility were collected during an on-site visual inspection and through a series of interviews and feedback cycles with facility managers at the institution. Detailed cost estimates for the replacement value and renewal cost of each system were developed using the VFA.facility software application, which has the widely accepted R.S. Means construction cost estimating database embedded within it. R.S. Means estimates, already localized by a city cost index by Means, were further adjusted (up) to match the historical project cost experiences represented by a cross section of Kentucky public postsecondary institutions. For consistency between campuses, the same adjustment factors were made across all institutions. Expected useful lifespans for individual building systems were based on Building Owners & Managers Association (BOMA) standards and verified though consultation with CPE and APPA (formerly the Association of Physical Plant Administrators). A detailed account of these sources and adjustment factors is presented in Appendix A2.

Selected buildings that were less than five years old were assumed in "good" condition (because of their young age). Their future system renewal needs were included in the condition study by modeling system types and renewals based on construction records and interviews with university facility managers. This produced data compatible with the Level 1 (and Level 2) assessments. No physical walk through or visual inspection was conducted on these buildings. (As expected, due to their young age, many 5-year-old-or-less buildings had no renewals due within the coming five years, and hence an FCI = 0.)

Each asset greater than five years old was assumed to have a backlog of systems that were at or beyond their expected useful life. In determining the backlog, all capital renewals due in 2006 or previous years were defined as "deferred capital renewals." Renewals due in 2007 or beyond were treated as future capital renewals.

It is worth noting that the Level 1 Lifecycle Condition Assessment process does not include identifying "deferred maintenance" deficiencies. These facility needs, while often rising to the level of requiring capital investment to address, would each require less than replacing each deficiency's entire system. (Replacements of entire systems are called renewals, and are included in Level 1 LCAs.) Identifying and estimating the cost of deferred maintenance requirements is a service available through VFA's Level 2 Detailed Facility Condition Assessments.

In the Space Adequacy or Fit-for-Continued-Use portion of the study, buildings selected by CPE and the institution were visually inspected for compliance with 9 metrics of the facility's educational adequacy. Where gaps were identified, recommended corrective actions were developed, including cost estimates for those actions. Cost estimates were based on historical averages for similar upgrades at higher education institutions nationwide, and adjusted to coincide with the replacement values for similar building types estimated in the VFA condition study.

The Space Capacity portion of the study addresses the need for additional educational and general (E&G) space to meet the needs of the student and staff population, both now and into the future, based on enrollment data and projections provided by CPE.

Detailed methodologies explaining both the condition assessment and the space study are presented in Appendices A2 (Condition) and A4 (Space).

Data

Detailed records of each building in the study are presented in the appendices:

Appendix A3. Facility Condition Data Reports

- Asset List Report
- Asset Detail Report(s)
- System Renewal Report, by Year
- System Renewal Crosstab Report

Appendix A5. Space Study Data Reports

- Building Space Fit-for-Continued-Use Profiles
- Space Capacity Detailed Report

Complete electronic records of each asset are available for licensed users of VFA.facility, VFA's capital planning and management software system. VFA.facility software offers the flexibility to investigate, analyze and model the capital needs for each institution, and for the Kentucky postsecondary education system as a whole.

Outcomes

KPES' and EKU's goal is to gain a complete picture of Kentucky's public higher education facility capital needs over the coming 15 years.

To that end, this study presents some valuable pieces of that picture, though not yet a complete picture:

Condition:	Major system renewal needs for 55 assets, or 2.8 million square feet of space (61% of portfolio)
Space Adequacy:	"Fit-for-continued-use" ratings, and cost estimates for upgrades, for 10 buildings (5% of portfolio).
Space Capacity:	Capacity projections and cost estimates for EKU's education and general use

space needs, now and to meet 2020 enrollment goals.

Funding Source Options: A summary of options for funding higher education capital needs, presented at a statewide level. Funding options are most efficiently approached across Kentucky's postsecondary education portfolio, and are not broken down by institution within this report.

Section 6 of this report presents the 15 year capital needs outlook for each portion of the study. The 15-year plan also presents models for how EKU might want to invest in those needs, based on various spending patterns and strategic priorities. The spend alternatives are included to demonstrate how a truly complete picture of Kentucky's public higher education capital plan might be constructed.

However, as mentioned in the Limitations section below, the outcome of the present study does not present a 100% complete picture of the whole. Each portion of the study is valuable on its own, but the condition, space adequacy and space capacity needs portions each examined only a specific group of each institution's facilities. Further, the Space Capacity projections, while updated from the Paulien 1999 model (revised by Paulien in 2001), may not be aligned with other strategic initiatives underway or planned at individual institutions.

Section 6 includes the consultants' team suggestions for further work to align goals and construct a more complete picture of Kentucky's public higher education facility capital needs.

In the condition assessment portion of the study, VFA found the amount of system renewals required by the great majority of EKU's facilities to be consistent with the age and use of each facility, and many buildings to be surviving (for the time being) past their expected useful lifespans. And while there are examples of major capital investment in new facilities, the amount of investment in the existing building stock has not met these buildings' aging needs.

Limitations

It is important to note a few limitations to the VFA | Paulien portions of the study:

- **Assessed only selected buildings** – 55 of EKU's facilities (29% of the number of buildings), comprising 2.8 million gross square feet (61% of gross square footage), were included in the condition assessment. Further study or modeling of the remaining assets would be required to gain a 100% complete picture of the condition or capital needs of the institutions.
- **Assessed for budgeting purposes –** The survey outcomes are intended for planning and budgeting purposes; they are not intended to provide construction specification-grade information about an asset. Outcomes for condition needs, space adequacy needs and space capacity needs may be added together to ascertain a more rounded picture of an institution's needs (in fact, the project team encourages such a blended view of capital investments for each asset/campus), however because such a limited portion of most institutions' portfolio was studied, the "blended" picture is far from complete.
- **Assessed for system renewals only** – The Level 1 LCA services provided under this contract included profiling the type, condition and renewal needs of each building and its major systems. The condition assessment does NOT provide a detailed list of requirements for each building. (This service is available through VFA's Level 2 Detailed Facility Condition Assessment.) Thus, while projecting system renewals over 15 years, the forecast does not account for sub-component needs related to a system unless they collectively contribute to general system failure. These are sometimes called "deficiencies" or "requirements," are usually concentrated in the next 1-5 years, and again, are not included in this report.

  Also not included in the study is any assessment of the day-to-day facilities operations. The study specifically and intentionally focused on the level of investment needed for major system renewals only. The study collected no data and draws no conclusions about how institutions are

budgeting to address daily operations and maintenance of their facilities.

- **Space Study only for selected Education and General buildings –** The Space Study included 10 buildings at EKU. This represents only 5% of the total number of buildings (and 19% of gross square footage). The space adequacy study is intended to summarize the adequacy of the study buildings only. Since the buildings surveyed were not chosen to serve as a statistical sample of the overall university's space adequacy, extrapolation of the space adequacy results to model all adequacy needs for each institution is not recommended.
- **Space capacity projections include Education & General Space only** – The Space Capacity Study accounted for the education and general space at each institution, the institution's current enrollment, and the 2020 enrollment projections. Needs for residential and related enterprise space such as agriculture were not included. As noted, further survey or advisory services are available from the VFA | Paulien team to help fill in any gaps in the information that are deemed of high importance.

Section 3: Study Overview: Project Organization & Implementation

Organization

In April, 2006, the Council on Postsecondary Education contracted with VFA, Inc. of Boston, MA, as prime contractor, to conduct the overall facility condition and space adequacy | needs study. VFA provided overall project management as well as facility condition assessment services and capital planning software for the project. VFA teamed with higher education space planning experts Paulien & Associates of Denver, CO, to provide the Space Adequacy / Fit-for-Continued-Use and Space Capacity portions of the study. And, as a subcontractor to Paulien, the National Center for Higher Education Management Systems, of Boulder, CO, provided an analysis of funding sources KPES may want to consider when deciding how to implement the 15 year capital plans.

A project organization chart is shown in Figure 3.1

Figure 3.1 Project Organizational Chart

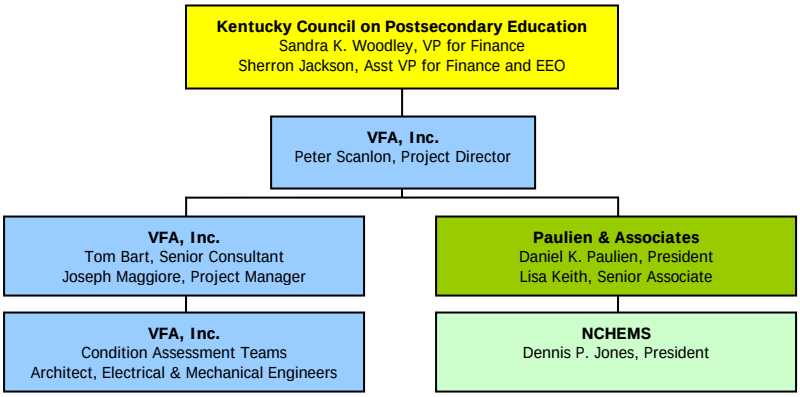
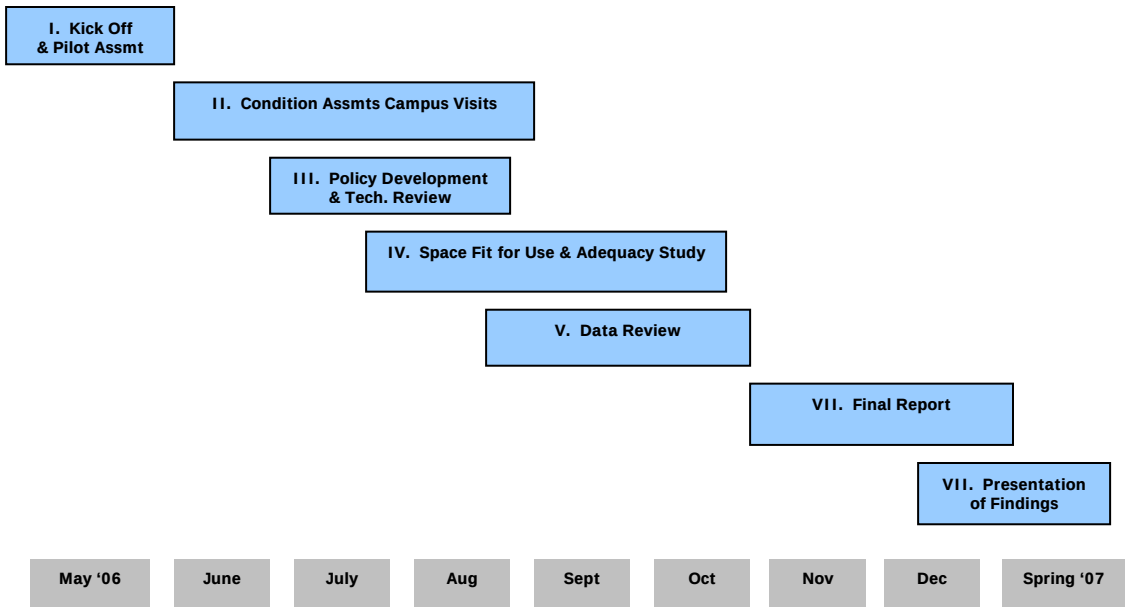


Figure 3.2: Project Schedule



Implementation

The study proceeded under a fast track schedule during which 27 million square feet, and 700+ assets, were assessed statewide during five months of 2006. Figure 3.2 illustrates the major portions of the project schedule.

Phase I: Kick Off & Pilot Assessment

The project kicked off in early May 2006 at a planning meeting hosted by Kentucky State University and attended by representatives of the Council, each of the public postsecondary education institutions, and the VFA | Paulien project team. The overall project schedule and methodology were presented, and a pilot assessment was conducted.

For the pilot assessment, a team of VFA assessors conducted a Level 1 Life Cycle Assessment of 2 facilities on the KSU campus. Representatives from each institution joined the VFA team to familiarize themselves with the Level 1 LCA process. During a debriefing session at the conclusion of the visual inspections, questions about the process, standards and schedule were answered.

In the weeks following the kick-off meeting, VFA developed sample data and reports based on the KSU pilot buildings. The reports were submitted to the Council and institutional representatives, who approved the data content and format that would be used for the subsequent Level 1 LCAs on their respective campuses.

Phase II: Campus Visits

During the summer and fall of 2006, assessment teams from VFA and Paulien visited selected buildings at each institution.

Data generated in the Facility Condition Assessment portion of the study was collected by teams of VFA assessors – typically architects, electrical and mechanical engineers and/or facility managers – during a visual inspection of each asset. The detailed project assessment schedule is included in Appendix A1.

During the visual inspection, VFA assessors interviewed key facility managers at the institution, profiled the type, age, condition and renewal actions due for each major system of each building/infrastructure asset. Assessors also took digital photos, which are included in the reports and stored in the project database.

Upon completion of the field visit, the assessment teams began the data and cost estimating portion of the work, when they developed detailed cost estimates of each building system, the time remaining in each system's useful life, and the likely cost of renewing the system at the end of its useful life.

The replacement values of each system were totaled for each asset to derive a current replacement value (CRV) for that asset. CRVs presented in the data are intended to represent the construction cost of replacing the building (or system), with a similarly functioning building/system, in 2007 dollars. The CRVs do not include any "upgrades" of particular systems unless current building methods make the upgrade equal or less expensive.

Phase III: Policy Development and Technical Review

The project team worked closely with the Council to develop policies that would guide the submission, review and possible adjustment of the data. Guiding principles that shaped these policies included goals of:

- Accuracy: data should reflect actual conditions for each facility, as closely as possible given methodologies used for each portion of the study, providing a reliable record of the portfolio today.
- Consistency: similar standards, reference information and adjustment factors should apply uniformly to all institutions statewide, ensuring fair and equitable treatment across the postsecondary system.
- Transparency: all data sources, cost estimating and adjustment processes should be easy to reference, understand and track, providing maximum transparency to the information underlying the study's conclusions.

The process of reviewing and refining the data (Phase V, below) followed these principals as closely as possible.

Phase IV: Evaluation of Space Adequacy & Capacity

The Space Adequacy and Capacity portion of the study was led by Paulien & Associates. A detailed explanation of Paulien's methodology is included as Appendix A4.

Space Adequacy | Fit-for-Continued-Use Study

CPE and the institutions identified a specific set of education and general facilities for evaluation in the space adequacy study. The facility selection process was developed by CPE and was the same for each campus. Selection criteria for inclusion in the space adequacy study included: (a) research facilities, (b) constructed before 1965, (c) identified by the institution as being unfit for continued use, or (d) identified as being in too deteriorated condition to support programs currently housed in the space.

The key areas evaluated include:

- *Does the building serve the program's current and future needs either by design or retrofit?*
- *How do the spaces in the building fit today's expectations and/or can the building be reasonably renovated to meet those expectations?*
- *Is the building's physical condition adequate to meet program needs and today's expectations (including life safety issues) and how major of a conversion or renovation is needed?*
- *Where applicable, are research laboratories of acceptable, flexible dimensions and up-to-date equipment to sustain on-going use as modern research facilities?*

Multiple rooms in each building were reviewed. The goal was to examine a sampling of the best, worst, and norm for the building. Classrooms, laboratories, offices, special use spaces, and bathrooms are examples of spaces reviewed. Mechanical and structural spaces were typically not included.

At the end of each day's assessments, the team discussed each building and collectively determined each building's criteria rating and recommended action.

Building Design

When evaluating the buildings in the space adequacy study, there were several conditions examined on a case-by-case basis. These conditions contributed to the recommended action

for each building. Where possible these types of issues are included in the comment section of each building's evaluation. In general, it is important for a facility to promote and serve the activities and programs it houses as well as support the mission and overall master plan of the institution. It is entirely possible that a building was designed for and adequately serves the programs it houses yet be physically located in the wrong precinct of a campus or be a smaller single story building in a prime location that would be better served by a larger, multi-story building.

Some of the buildings were specifically designed for the programs contained in them or for the functions they serve, yet the building may now be overcrowded due to the institution's/ program's growth or the physical design is antiquated for today's standards or the construction materials do not allow for an cost-effective or efficient renovation. Certain buildings are on the historical registry. Many of these older facilities are best suited for administrative offices and not instructional programs. If the building does not meet ADA requirements then the additional constraint is that the administrative function should not be one that is high profile which generates a lot of people traffic.

Space Adequacy Assessment

The consultants reviewed nine criteria and rated each building on a one to four scale as follows: 1 = Unsatisfactory; 2 = Somewhat Unsatisfactory; 3 = Somewhat Satisfactory; 4 = Very Satisfactory; 0 = Not Applicable. An average rating was calculated based upon the criteria that were applicable to the building. The nine criteria are:

1. *Room Capacities*
2. *Functionality*
3. *Suitability to Purpose*
4. *Flexibility of Space for Different Learning Styles*
5. *Gathering Space*
6. *Multi-Media Technology*
7. *Computers and Connectivity*
8. *Instructional Laboratories / Lab Equipment*
9. *Research Laboratories / Lab Equipment*

Physical Condition

Each building's physical condition was reviewed in general terms. Areas of observation included, but were not limited to: ADA accessibility, roof leakage, asbestos related materials, air quality/condition issues, electrical and lighting issues, window glazing, elevator presence and condition, type of construction, and general maintenance of the building.

Buildings were then categorized into four major groups to more easily quantify the estimated renovation costs for the adequacy study.

The four categories used ($25/sf, $50/sf, $75/sf, $150/sf) provide budgetary guidance which should fall within a plus or minus 20% range of actual costs. The dollar value selected (as part of the space study estimates) includes all costs, both soft and hard. Categories carrying $25/sf and $50/sf renovation costs were termed "minor" --- indicating they could likely be occupied during renovation (mostly finishes, slight reconfigurations). Categories carrying $75/sf and $150/sf were termed "major" renovations – indicating the need to move all occupants out during renovation. Also, when we refer to a renovation as "major" we are attaching a sense of urgency to the need.

How were the four costs ranges determined and what documentation from the construction industry was used? Until recently, all construction estimates and contracts were guided by the Construction Specifications Institute Format (CSI) and the 16 divisions therein:

Division 1 General Conditions
Division 2 Site Work
Division 3 Concrete
Division 4 Masonry
Division 5 Metals
Division 6 Wood & Plastics
Division 7 Thermal & Moisture Protection
Division 8 Doors & Windows
Division 9 Finishes
Division 10 Specialties
Division 11 Equipment
Division 12 Furnishings
Division 13 Special Construction
Division 14 Conveying Systems
Division 15 Mechanical
Division 16 Electrical

The CSI format has been in use for 75 years or so, and is well suited for use in estimating the renovation costs. CSI has revised the format recently, but this traditional version was used. Each of the Divisions above has several subheadings--- for example, Division 9 - Finishes

has 14 subheadings among which are Painting, Tile, Carpet, Acoustical Treatment, etc. Division 15 - Mechanical has 12 subheadings among which are Plumbing, Fire Protection, Air Distribution, etc. Therefore, ALL pieces of a building are given in the CSI format. In a simple but lengthy process, an experienced construction estimator could assign square foot values to all the nearly 200 subheadings and have the information necessary for a reasonably accurate renovation cost. Paulien's construction consultant, Wayne Elwell, used his experience to provide values for most of the subheadings necessary for budgetary purposes. These incremental pieces, for example, $15/sf for a new HVAC system, $12/sf for an updated electrical system, $4/sf for new paint, etc., all contribute to the number that fits one of the four categories.

Space Needs Study

The Finance Unit from CPE provided a Fall 2004 facilities inventory, staff full time equivalents, and research expenditure data for each of the institutions. The Council also provided enrollment, staffing and research expenditure projections for year 2020.

The Space Model used in the current study was based on the 1999 Space Needs Model developed for CPE by Paulien & Associates, updated by Paulien in 2001, and again updated during this study per the consultant's recommendations to reflect changing use standards and the physical limitations of certain Kentucky buildings.

The existing assignable square footage (ASF) used in the model reflects educational and general (E&G) state supported space only. It does not include hospital space, farms, and locations (remote locations and service centers) off the main campus. This is important as the student and staff full-time equivalents (FTE) include all students and staff for an institution. The Kentucky postsecondary education system provided a dataset of the spaces to be included in the model. It was the consultants' understanding that the non E&G spaces were removed. As the study progressed, the consultants found parking garages, leased space, farm space, and other spaces that typically should have been excluded in the model were actually included at individual institutions. Where possible, the consultants excluded these spaces. Council staff was informed of these anomalies, and agreed that these adjustments should be made. In future applications of the space model, the consultants encourage the Council and the institutions to review the spaces carefully so that each institution is being measured appropriately against the model.

Phase V: Institutional Review of Data

As campus visits were ending during the summer of 2006, ten representatives of the Council and institutions were trained on the capital planning software, VFA.facility. These facility managers and planners then reviewed draft condition data developed by VFA. Current Replacement Values for each asset and system definitions and scopes were reviewed by representatives of each institution. Where gaps in cost or scope were identified by the institutions, and supported by historical or industry standard data, VFA adjusted the data. A list of adjustments is included as Appendix A6.

Some cost adjustments were statewide and necessitated comparison of Kentucky data to national norms, as defined by APPA, or a compilation of historical data from Kentucky institutions. In these cases, VFA carefully compared the scope and costs, and where necessary, considered specific adjustments. The Council had final approval on which adjustment factors would be applied statewide, and which could be applied specifically to each institution's data.

Phase VI: Final Report

A draft of the Final Report was assembled and produced for the Council during December 2006. Each institution received a copy of Part I, the Council-level Executive Summary, plus the portions of Part II applicable to their institution.

Comments from the Council and the institutions on a draft of the report were incorporated in the Final Report.

Phase VII: Presentation of Findings

At the time of this writing, the consultants' team of VFA | Paulien | NCHEMS plans to present the findings of the study to the Council during the spring of 2007.

Section 4. Facility Condition Assessment

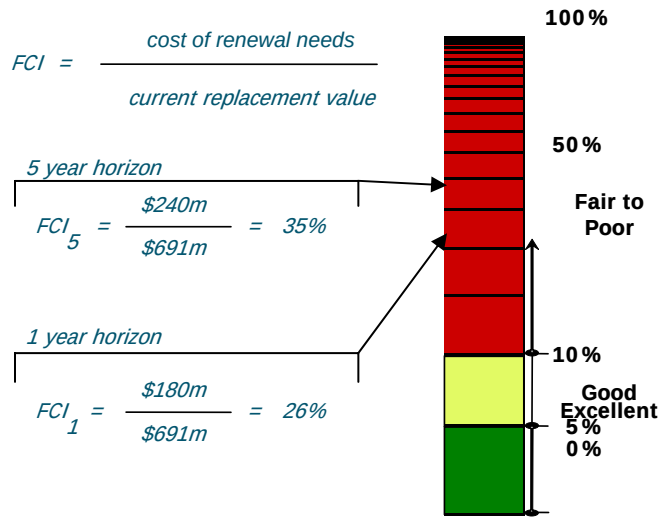
How do Eastern Kentucky University's facilities compare?

At EKU, for the 55 facilities assessed, the estimated cost of system renewals currently due (1-YR Renewal Cost) is $180 million, and the estimated cost of renewals due within the next 5 years (5-YR Renewal Cost) is $240 million. (Note: present 2007 dollars are used in all reported numbers. Inflation factor considered = zero.)

The facilities assessed have a current replacement value of $691 million, so the Facility Condition Index (cost of renewals, divided by current replacement cost) for the portfolio is 26% for a 1-year horizon, and 35% for a 5-year horizon. Based on International Facility Managers Association standards, both the 1-year and 5-year FCIs would be considered "fair" to "poor" rankings.

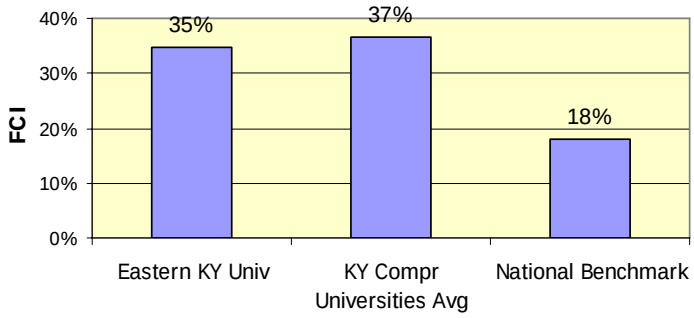
Compared to other higher education portfolios evaluated by the consultants' team over the past 5 years, EKU's is in worse condition (35% EKU 5-year FCI vs. 18% benchmark 5-year FCI).

Figure 4.1: Eastern Kentucky University Facility Condition Index



Condition ratings based on International Facilities Managers Association standards.

Figure 4.2: EKU 5-Year FCI Comparison



What are the most urgent facility condition needs?

This Executive Summary highlights the capital renewal needs of EKU assets. More detailed information is available in Appendix A3 or in KPES' VFA.facility database (http://kcpe.vfafacility.com).

Of the assessed assets, EKU as a whole has 107 facilities in "Satisfactory" condition, 151 requiring "Remodeling A" work, 314 requiring "Remodeling B" work, and 164 requiring "Remodeling C" work. Based on condition alone, none of the assessed assets required Demolition or Termination.

Figure 4.4 ranks the facilities assessed at EKU by their 5-year Facility Condition Index.

To see which systems across the EKU portfolio require the most renewal work, Table 4.5 lists the 5-year facility renewal needs by major system type. Communications and Security, HVAC Distribution Systems, Electrical Service & Distribution, and Lighting and Branch Wiring are the systems requiring the most immediate large scale investment.

A complete list of all facilities assessed, showing renewal needs by year, is included in Appendix A3 in the System Renewal Crosstab Report.

Figure 4.3: SUMMARY OF EKU BUIDLINGS BY CONDITION CODE

APPA CONDITION CODE	MIN FCI	# Bldgs	5-YR RENEWAL COSTS
1 - Satisfactory	0%*	9	$ 44,000
2 - Remodeling A	0%	8	10,808,000
3 - Remodeling B	25%	30	174,652,000
4 - Remodeling C	50%	8	54,243,000
5 – Demolition		0	0
6 - Termination		0	0
		55	$ 239,746,000

*No single need > $40k

A list detailing specific system renewals (and in which asset they are located) for years 2007 through 2022, is provided in Appendix A3, as the System Renewal Report.

The tables and reports included in this document represent only a small fraction of the ways the facility condition data can be sorted, organized, subtotaled and analyzed. More detailed (or differently organized) data is available in the VFA.facility software for data export and further detailed exploration.

Condition Study vs. Space Study Recommendations:
VFA's condition assessment (Section 4) and Paulien's space study (Section 5) evaluated facilities based on different criteria, and in some cases different recommendations are shown for the same building. This is entirely appropriate, given the different questions posed to each team. For example: VFA was asked to evaluate the condition of facilities based on their current use only, not considering the appropriateness or cost of adapting a building to a new use, while Paulien's space study specifically addressed the possibility of adaptive re-use for buildings. Also, VFA did not categorize any asset in 'Demolition' despite a small number of buildings having very high FCIs. (Assets with FCIs over 75% are sometimes considered good candidates for replacement.) The space study in Section 5 incorporated different standards for evaluating buildings, and may have reached different conclusions.

Table 4.4: Eastern Kentucky University Facilities, Ranked by 5-Year FCI

Institution: Campus	Asset Name	Asset Replacement Value	5YR FCI Cost	5YR FCI ↓	5-YR Building Condition Code
Eastern Kentucky University					
EKU:01	DONOVAN COMPLEX	30,829,000	18,770,000	61%	4. Remodeling C
EKU:01	JOHN ROWLETT BLDG	10,125,000	5,938,000	59%	4. Remodeling C
EKU:01	BREWER BLDG.	656,000	365,000	56%	4. Remodeling C
EKU:01	CARTER BLDG.	5,075,000	2,786,000	55%	4. Remodeling C
EKU:01	MATTOX HALL	9,895,000	5,334,000	54%	4. Remodeling C
EKU:01	CRABBE LIBRARY	31,851,000	16,628,000	52%	4. Remodeling C
EKU:01	RAMSEY HEAT PLANT	2,067,000	1,076,000	52%	4. Remodeling C
EKU:01	GIBSON	6,568,000	3,346,000	51%	4. Remodeling C
EKU:01	FRANK GENTRY	3,936,000	1,950,000	50%	3. Remodeling B
EKU:01	CASE BLDG. ANNEX	11,972,000	5,927,000	50%	3. Remodeling B
EKU:01	CARL D. PERKINS BLDG.	25,937,000	12,503,000	48%	3. Remodeling B
EKU:01	KEITH	8,476,000	4,084,000	48%	3. Remodeling B
EKU:01	BECKHAM	3,430,000	1,630,000	48%	3. Remodeling B
EKU:01	JOHN BLACK BLDG.	849,000	399,000	47%	3. Remodeling B
EKU:01	COMBS CLASSROOM BLDG.	32,208,000	15,027,000	47%	3. Remodeling B
EKU:01	STRATTON BLDG.	37,130,000	16,952,000	46%	3. Remodeling B
EKU:01	WALLACE BLDG.	26,805,000	12,113,000	45%	3. Remodeling B
EKU:01	BEGLEY BLDG. / KIDD STADIUM	37,155,000	16,624,000	45%	3. Remodeling B
EKU:01	MCCREARY	2,375,000	1,056,000	44%	3. Remodeling B
EKU:01	MILLER	2,395,000	1,032,000	43%	3. Remodeling B
EKU:01	FITZPATRICK	7,826,000	3,367,000	43%	3. Remodeling B
EKU:01	AULT	6,823,000	2,894,000	42%	3. Remodeling B
EKU:01	POWELL UNIVERSITY CENTER	36,387,000	15,358,000	42%	3. Remodeling B
EKU:01	JANE F CAMPBELL BLD	20,741,000	8,743,000	42%	3. Remodeling B
EKU:01	WEAVER	13,200,000	5,533,000	42%	3. Remodeling B
EKU:01	MEMORIAL SCIENCE	8,626,000	3,584,000	42%	3. Remodeling B
EKU:01	JONES BLDG	7,743,000	3,143,000	41%	3. Remodeling B
EKU:01	ROARK	7,385,000	2,894,000	39%	3. Remodeling B
EKU:01	MOORE BLDG	22,592,000	8,703,000	39%	3. Remodeling B
EKU:01	GABBARD BUILDING	1,795,000	671,000	37%	3. Remodeling B
EKU:01	ALUMNI COLISEUM	35,178,000	12,886,000	37%	3. Remodeling B
EKU:01	KEEN JOHNSON BUILDING	15,061,000	5,512,000	37%	3. Remodeling B
EKU:01	FOSTER	7,754,000	2,797,000	36%	3. Remodeling B
EKU:01	COATES	13,846,000	4,538,000	33%	3. Remodeling B
EKU:01	RANGE CONTROL BLDG.	199,000	61,000	31%	3. Remodeling B
EKU:01	BURRIER	11,344,000	3,437,000	30%	3. Remodeling B
EKU:01	L. O. MARTIN	4,089,000	1,192,000	29%	3. Remodeling B
EKU:01	PARK OBSERVATORY	152,000	41,000	27%	3. Remodeling B
EKU:01	DIZNEY BUILDING	11,123,000	2,332,000	21%	2. Remodeling A
EKU:01	ASHLAND FIRE SCIENCE BLDG.	1,888,000	284,000	15%	2. Remodeling A
EKU:01	LITTLE BLDG.	15,399,000	2,277,000	15%	2. Remodeling A
EKU:01	FUNDERBURK BLDG.	20,299,000	2,895,000	14%	2. Remodeling A
EKU:01	CAMMACK	6,825,000	873,000	13%	2. Remodeling A
EKU:01	UNIVERSITY BLDG.	5,327,000	666,000	12%	2. Remodeling A

Institution: Campus	Asset Name	Asset Replacement Value	5YR FCI Cost	5YR FCI ↓	5-YR Building Condition Code
EKU:01	HUMMEL PLANETARIUM	7,848,000	909,000	12%	2. Remodeling A
EKU:01	MOBERLY BLDG.	8,312,000	573,000	7%	2. Remodeling A
EKU:01	MEADOWBROOK MILKING PARLOR	654,000	44,000	7%	1. Satisfactory
EKU:01	BIZZACK FITNESS & WELLNESS CENTER	4,459,000	0	0%	1. Satisfactory
EKU:01	BIZZACK LAW ENFORCEMENT TRAINING COMPLEX	36,663,000	0	0%	1. Satisfactory
EKU:01	BUSINESS & TECHNOLOGY BLDG.	17,846,000	0	0%	1. Satisfactory
EKU:01	DRIVING SIMULATOR BLDG.	1,536,000	0	0%	1. Satisfactory
EKU:01	McKINNEY SKILLS BLDG.	2,226,000	0	0%	1. Satisfactory
EKU:01	MEADOWBROOK FREE STALL BARN	730,000	0	0%	1. Satisfactory
EKU:01	STUDENT FITNESS & WELLNESS CENTER	11,433,000	0	0%	1. Satisfactory
EKU:01	STUDENT SERVICES BUILDING	27,865,000	0	0%	1. Satisfactory

Table 4.5: EKU Building Systems Ranked by 2007 Dollar Value Renewal Needs

(figures in millions of dollars)

> $10 million
> $1 million

SYSTEM NAME	2007 + backlog ↓	2008	2009	2010	2011	5-YR TOTAL	15-YR TOTAL
Communications and Security	36.017	0.162	0.486	0.079	0.191	36.935	79.959
Distribution Systems	31.376	2.700	1.048	1.197	0.323	36.644	41.131
Electrical Service and Distribution	21.458	0.000	1.946	0.000	0.000	23.404	24.668
Lighting and Branch Wiring	15.508	0.000	0.000	0.000	0.476	15.985	16.765
Floor Finishes	7.803	0.439	0.324	1.162	7.760	17.488	35.684
Exterior Windows	6.492	0.000	0.000	0.000	5.743	12.234	14.846
Controls and Instrumentation	6.460	0.736	0.553	0.003	0.238	7.991	9.227
Ceiling Finishes	6.165	0.874	0.064	0.051	2.626	9.781	16.521
Equipment and Furnishings	4.817	0.241	1.364	1.239	10.224	17.885	27.818
Plumbing Fixtures	4.480	0.288	0.038	0.320	0.314	5.440	7.663
Domestic Water Distribution	4.352	0.212	0.000	0.000	0.000	4.564	6.188
Cooling Generating Systems	4.320	0.335	0.000	1.464	0.399	6.519	10.673
Heat Generating Systems	4.191	0.000	0.000	0.095	0.662	4.948	5.591
Wall Finishes	4.035	0.180	0.146	0.321	3.571	8.253	18.458
Emergency Light and Power Systems	3.772	0.000	0.014	0.095	0.000	3.881	6.795
Exterior Doors	3.067	0.000	0.887	0.000	2.994	6.948	7.903
Conveying	3.048	0.660	0.446	0.196	0.000	4.349	4.703
Fittings	1.675	0.000	0.724	0.006	1.927	4.332	6.640
Roofing	1.623	0.086	0.000	0.388	0.108	2.205	9.591
Fire Protection	1.617	0.000	0.231	0.006	0.007	1.862	3.293
Plumbing	1.460	0.000	0.246	0.576	0.599	2.881	5.870
Interior Doors	0.474	0.000	0.185	0.000	2.346	3.005	7.647
Other Plumbing Systems	0.147	0.000	0.000	0.000	0.000	0.147	0.180
Terminal and Package Units	0.104	0.000	0.000	0.142	0.000	0.246	0.734
Glazed Roof Openings	0.087	0.000	0.000	0.000	0.000	0.087	0.087
Exterior Walls	0.032	0.015	0.092	0.000	0.064	0.203	0.606
Exterior Soffits	0.019	0.000	0.000	0.000	0.000	0.019	0.019
Substructure	0.000	0.013	0.000	0.000	0.000	0.013	0.154
Partitions	0.000	0.000	0.000	0.424	2.370	2.794	10.145
Superstructure	0.000	0.000	0.000	0.000	0.000	0.000	0.425
Exterior Stairs and Fire Escapes	0.000	0.000	0.000	0.000	0.015	0.015	0.015
Stairs	0.000	0.000	0.000	0.000	0.055	0.055	0.390
Total	174.602	6.941	8.794	7.764	43.013	241.114	380.390

Section 5. Space Study
Evaluation of Adequacy and Fit for Continued Use

Daniel K. Paulien & Lisa M. Keith
Paulien & Associates
Denver, CO

OVERVIEW

Paulien & Associates, Inc. as part of the VFA team, reviewed selected buildings for educational adequacy and fit for continued use as well as reviewed and applied the KCPE Space Needs Model. The details of this process and methodology are included in the overall KCPE study.

The buildings included in the educational adequacy and fit for continued use study were selected by Council staff and the institution representatives. The outcome of this portion of the overall analyses does not represent an institutional summary – only the outcome for the buildings assessed.

2020 Projections

	Fall 2004	2020	Percent Increase
Student FTE	12,958	21,911	69%
Faculty/Staff FTE requiring Office Space	2,071	3,530	70%
Research Expenditures	$870,000	$1,471,144	69%

The student enrollment, faculty and staff, and research expenditure projections were provided by the Council for use in this study. The only space intended to be included in the Space Needs Model is Educational and General (E&G) space. Therefore all of the assignable square footage (asf) from a particular building may not be included. The Council provided a dataset of the spaces to be included in the model. It was the consultants' understanding that the non E&G spaces were removed. However at individual institutions parking garages, barns, and farm spaces were included. Where possible, the consultants excluded these spaces. Council staff was informed of these anomalies, and agreed that these adjustments should be made.

FIT FOR CONTINUED USE

The Donovan model school is now 45 years old. It consists of single story wings and two story wings which provide a complete elementary, middle and secondary school experience. Most lab schools have stopped functioning but this school seems to continue to serve Eastern Kentucky University and the clientele of the school well. The building will be difficult to convert to other uses effectively. The sizes of rooms do not allow modern teaching methods, particularly strongly in the middle school area where the rooms seem too small. This building takes up a lot of valuable land at a low floor area ratio. There is a possibility of a new lab school building incorporating some College of Education functions. The building would need major renovation and still might not serve as a model school for the next 50 years. Demolition and replacement seems an appropriate course.

Note Regarding Demolition:
The criteria that would cause a recommendation of demolition is different than the Lifecycle Conditions Assessment criteria set forth by VFA for this project. The criteria used for this portion of this assessment has to do with educational adequacy and fit for continued use and building design as it relates to these issues. While the building's physical condition was overviewed as part of this assessment it was done from the point of educational adequacy, land usage, etc., and what could/should be done to enhance the educational experience and the campus environment.

The consultants saw a number of other buildings which averaged 50 years in age. They were in four categories: 1) Wallace and

Cammack had recent renovations and appeared not to need any significant renovation; 2) Burrier, Combs Classroom, and Crabbe Library need minor renovations; 3) Memorial Science and Moore, which will be converted from the historic science uses, each need a major adaptive restoration. They are hard science buildings with finishes designed to minimize damage from science activity and they need a major aesthetic and educational renovation to serve effectively for social science uses. John Rowlett Building also needs major renovation. The classrooms seem crowded and not adequate for current group activity expectations. The laboratory beds for nursing could stand replacement to reflect more of the qualities of current clinical room amenities. The metal panel system used for partitions makes alterations difficult. It is especially difficult to alter existing electrical in the walls. Replacement of this system should be seriously considered. HVAC and glazing need to be brought to currently acceptable conditions. 4) Music would likely best be served by a new building. Foster is not a good building for music. The band room needs significantly more volume of space. It appears to be a dangerous room because of the amount of sound that can be generated by the band instruments in an undersized room.

Summary of Evaluation of Adequacy and Fit for Continued Use Outcomes

Building Name / No.	ASF in Space Model	Building Age	Rating	Recommended Action	Gross Sq. Ft.
Burrier • 0115	34,413	38	2.8	Minor Renovation	56,894
Cammack • 0104	12,876	88	3.1	None	28,247
Combs Classroom • 0112	66,560	42	3.0	Minor Renovation	132,004
Crabbe Library • 0113	97,185	78	4.0	Minor Renovation	158,115
Donovan • 0109	92,585	45	1.9	Demolition	119,752
Foster • 0108	20,073	49	1.5	Major Renovation and Assign to a New Use	36,983
John Rowlett Bldg • 0122	25,365	30	2.1	Major Renovation	53,566
Memorial Science • 0107	26,886	54	1.5	Major Renovation and Assign to a New Use	40,426
Moore Bldg • 0114	67,714	38	1.4	Major Renovation and Assign to a New Use	123,595
Wallace • 0118	57,729	35	3.6	None	118,011
Total ASF	**501,386**	**Total ASF in Space Model:** 1,634,906			**867,593**
No. of Buildings Assessed: 10		***Total ASF as a Percent of Total ASF in Space Model:*** *31%*			
Average		**50**	**2.5**	***Most Recommended Action:*** *Major Renovation and Assign to a New Use*	

Rating Scale: Unsatisfactory = 1; Somewhat Unsatisfactory = 2; Somewhat Satisfactory = 3; Very Satisfactory = 4

Estimated Renovation Costs

Building Name / No.	Gross Sq. Ft.	Renovation Type	Renovation Costs
Burrier • 0115	56,894	Category 2, Minor	$2,844,700
Cammack • 0104	28,247	None	$0
Combs Classroom • 0112	132,004	Category 2, Minor	$6,600,200
Crabbe Library • 0113	158,115	Category 2, Minor	$7,905,750
Donovan • 0109	119,752	Demolition @ $20	$2,395,040
Foster • 0108	36,983	Category 4, Major	$5,547,450
John Rowlett Bldg • 0122	53,566	Category 4, Major	$8,034,900
Memorial Science • 0107	40,426	Category 4, Major	$6,063,900
Moore Bldg • 0114	123,595	Category 3, Major	$9,269,625
Wallace • 0118	118,011	None	$0
Total GSF Assessed	**867,593**		**$48,661,565**
No. of Buildings Assessed: 10			

Renovation Costs per GSF: Category 1, Minor - $25; Category 2, Minor - $50; Category 3, Major - $75; Category 4, Major - $150; Demolition - $20 or $30

SPACE NEEDS MODEL

The space needs model shows that EKU is now short of both teaching laboratory space as well as support space. However, if instructional laboratories are examined as a combination of the teaching laboratory and open laboratory space categories this deficit becomes a surplus. Overall for 2004 the model shows that EKU has a 14% surplus of space.

For the 2020 projection, all space categories except open laboratories and research laboratories show significant space shortages. Without additional facilities, there will be an approximate 670,000 ASF shortage of space to meet the 2020 goals. Using a 62% net to gross ratio, the model illustrates a need for 1,082,000 more gross square feet.

Space Needs Model Application

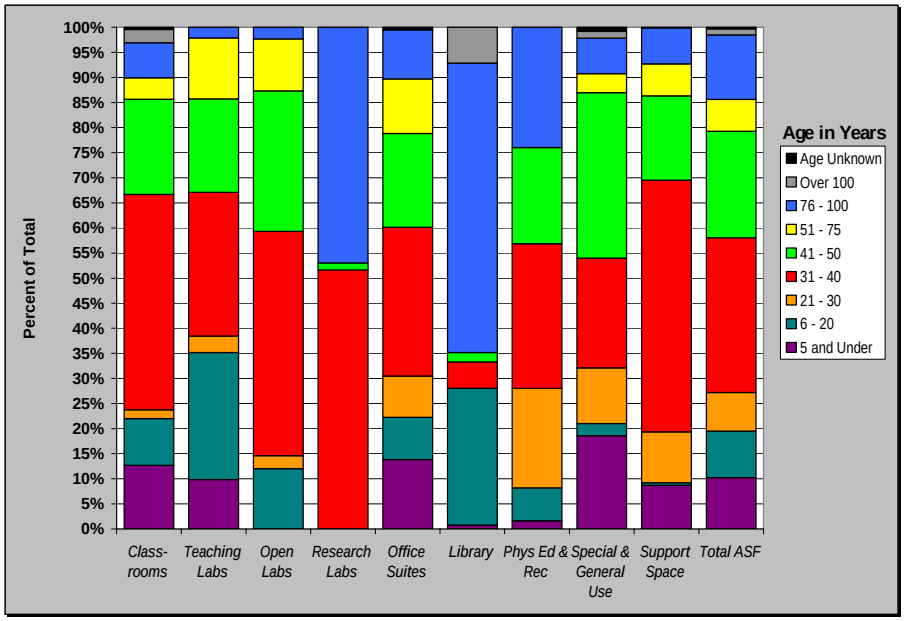
		Fall 2004 *Student FTE = 12,958* *Staffing FTE = 2,071* *Research Expenditures = $870,000*			2020 *Student FTE = 21,911* *Staffing FTE = 3,530* *Research Expenditures = $1,471,144*		
Space Category	**Existing ASF**	**Guideline ASF**	**Surplus/ (Deficit)**	**Percent Surplus/ (Deficit)**	**Guideline ASF**	**Surplus/ (Deficit)**	**Percent Surplus/ (Deficit)**
Classrooms & Service *12 ASF/Student FTE*	206,614	155,496	51,118	25%	262,932	(56,318)	(27%)
Teaching Laboratories *10 ASF/Student FTE*	76,769	129,580	(52,811)	(69%)	219,110	(142,341)	(185%)
Open Laboratories *8 ASF/Student FTE*	191,526	103,664	87,862	46%	175,288	16,238	8%
Research Laboratories *700 ASF/$100,000 R&D Expenditures*	10,775	6,090	4,685	43%	10,298	477	4%
Office Suites *195 ASF/Staff FTE*	436,312	403,845	32,467	7%	688,350	(252,038)	(58%)
Library *No Standard*	125,244	125,244	0	0%	125,244	0	0%
Physical Education & Recreation *12.10 ASF for 100% Undergraduate Student FTE, 25% of Graduate FTE, and 15% of Staffing FTE (75,000 ASF minimum)*	164,044	150,350	13,694	8%	254,278	(90,234)	(55%)
Special Use & General Use Space *18 ASF/Student FTE*	330,350	233,244	97,106	29%	394,398	(64,048)	(19%)
Support Space *8 ASF/Student FTE plus 4 ASF/Student FTE if land grant mission*	93,272	103,664	(10,392)	(11%)	175,288	(82,016)	(88%)
TOTAL	**1,634,906**	**1,411,177**	**223,729**	**14%**	**2,305,186**	**(670,280)**	**(41%)**

ASF = Assignable Square Feet

EXISTING E&G SPACE

Age of Existing E&G Facilities

Approximately 52% of EKU's space is between 30 and 50 years old. Twenty-one percent (21%) of its space is over 50 years old.



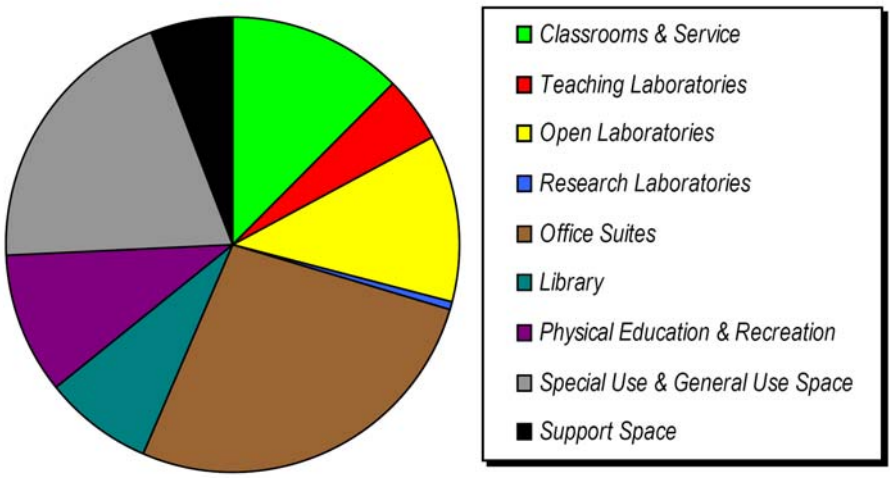
Comparison of Existing E&G Space to KCPE Comprehensive Universities Average

EKU has 126 ASF per Student FTE which is approximately 94% of the KCPE Comprehensive University average. While it has approximately 50% less teaching laboratory space than the other comprehensive universities it has 67% more open laboratory space. After combining both of these categories for a complete look at instructional labs, EKU is right at the 21 ASF average but more than the combined space modeling factor of 18 ASF per student FTE.

	Existing E&G Facilities		KCPE Comprehensive Universities	
Space Category	ASF per Student FTE	% of Total	Average ASF per Student FTE	Range of ASF
Classrooms & Service	16	13%	16	*10 - 21*
Teaching Laboratories	6	5%	12	*6 - 25*
Open Laboratories	15	12%	9	*4 - 15*
Research Laboratories	1	1%	3	*.29 - 8*
Office Suites	34	27%	35	*23 - 61*
Library	10	8%	11	*7 - 20*
Physical Education & Recreation	13	10%	20	*4 - 59*
Special Use & General Use Space	25	20%	19	*7 - 32*
Support Space	7	6%	10	*3 - 18*
TOTAL	**126**	**100%**	**134**	**83 - 255**

Distribution of Existing E&G Space by Space Category

Thirty percent (30%) of EKU's space is instructional space (classrooms and all laboratory categories). Office space is 27% of the space included in the model. Another 20% of its space is in the special use and general use space category



NOTE: The percentages are found in the "Percent of Total" column in the table above.

Section 6: 15 Year Capital Plan

The 15-year Capital Plan presented in this section incorporates all three portions of the study – condition, space adequacy & space capacity. Condition and space funding needs are presented separately first, and then aggregated together to show the total funding needed for the university facilities included in the study. In addition, two views of the spending pattern are shown:

- **Actual** – with spending assumed to vary to meet the annual dollar amount predicted by the forecasts each year;
- **Strategic** – with spending aligned to meet strategic goals recommended by the consultants for each five year period of the 15-year plan. The strategic goals and timeframes can be adjusted to match priorities set by the Council and the institutions.

Table 6.1: EKU 15-year Actual Capital Needs

Data supports Figures 6.2 through 6.4. Note: In 2007 dollars, Inflation factor set to 0%.

Funding Year	Condition Needs	Space - Adequacy	Space - Current Capacity	Space - Future Capacity	Total Funding
2007	$ 174,630,000	$ 48,662,000	$ 4,693,000	$ -	$ 227,985,000
2008	6,914,000	-	-	-	6,914,000
2009	8,794,000	-	-	-	8,794,000
2010	7,764,000	-	-	-	7,764,000
2011	43,013,000	-	-	-	43,013,000
2012	6,469,000	-	-	25,507,000	31,976,000
2013	6,577,000	-	-	26,783,000	33,360,000
2014	6,049,000	-	-	28,058,000	34,107,000
2015	5,294,000	-	-	29,334,000	34,628,000
2016	50,853,000	-	-	30,609,000	81,462,000
2017	6,236,000	-	-	31,884,000	38,120,000
2018	3,909,000	-	-	33,160,000	37,069,000
2019	7,170,000	-	-	34,435,000	41,605,000
2020	4,004,000	-	-	35,710,000	39,714,000
2021	42,716,000	-	-	36,986,000	79,702,000
Total	$ 380,392,000	$ 48,662,000	$ 4,693,000	$ 312,466,000	$ 746,213,000

ENDING FCI = 0%

Actual Needs

The "actual needs" summarized here depict the amount of capital investment estimated to be needed in each of the next fifteen years based on the consultant team's professional opinion of when each need would come due. The needs are broken out by three reasons that investment might be required: (a) to address system renewals that are driven by poor physical condition (orange for first year, red in later years), (b) to address space adequacy issues preventing a facility from being utilized in its highest and best use by current educational standards (green), and (c) to grow space capacity to meet current (light blue) and future (dark blue) enrollment projections.

Based on condition alone, Eastern Kentucky University's Lifecycle Condition Assessments identified $174 million in deferred capital renewals due in or before 2007, and $241 million by 2011, creating a starting 5-Year FCI of 35% (next 5-year renewal needs / current replacement value).

Spending that amount would reduce the FCI to zero and bring all assessed facilities into excellent condition. Maintaining an FCI level = 0% forecasts needing an additional $138 million in capital renewals over the following 10 years, for a 15-year total capital renewal need of $379 million. (Note: All in 2007 dollars; Inflation factor = 0%.)

If the University funded the capital renewals in the exact years each renewal is forecast to be due, the investment pattern would look like Figure 6.2.

The Space Study identified $48 million needed to make selected buildings fit-for-continued-use, plus $4.7 million needed for E&G buildings to meet current enrollment capacity, and $312 million needed for E&G buildings to meet the 2020 enrollment projections. Figure 6.3 shows capital investments based on space needs, including investment in future capacity starting in the second 5-year period, and growing modestly over the following 10 years until all space capacity needs are met by 2021.

When aggregated together, the condition + space needs of the University look like the spend pattern shown in Figure 6.4, totaling $746 million (in 2007 dollars, inflation = 0%).

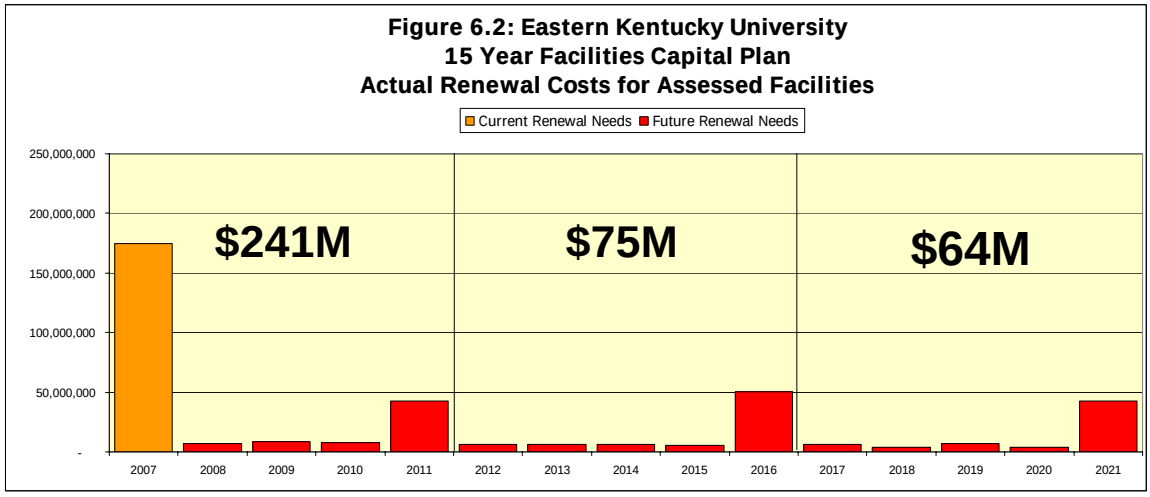


Figure 6.2: Eastern Kentucky University
15 Year Facilities Capital Plan
Actual Renewal Costs for Assessed Facilities
Current Renewal Needs
Future Renewal Needs
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
-
$241M
$75M
$64M
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

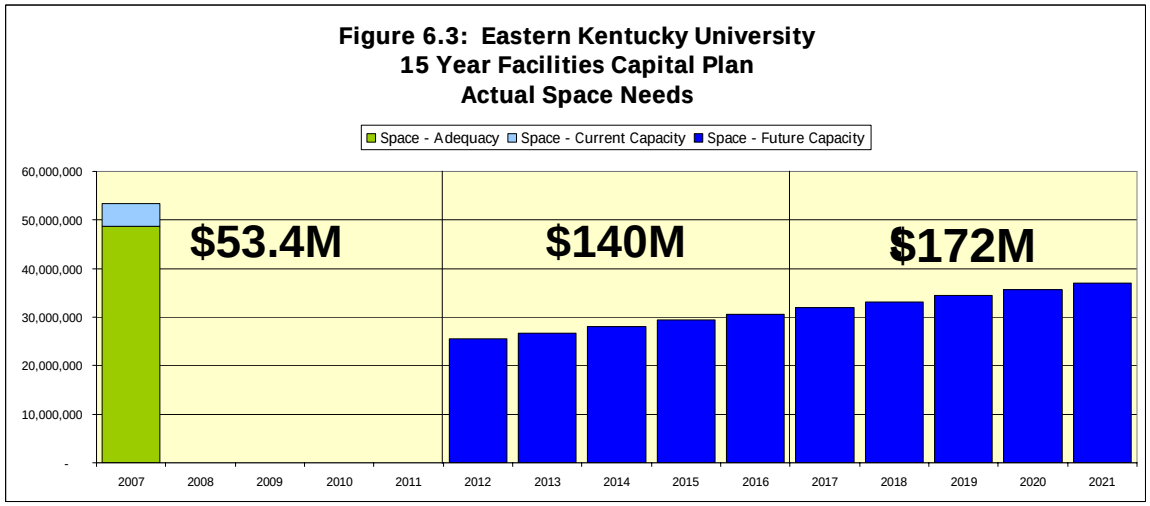


Figure 6.3: Eastern Kentucky University
15 Year Facilities Capital Plan
Actual Space Needs
Space - Adequacy
Space - Current Capacity
Space - Future Capacity
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
-
$53.4M
$140M
$172M
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

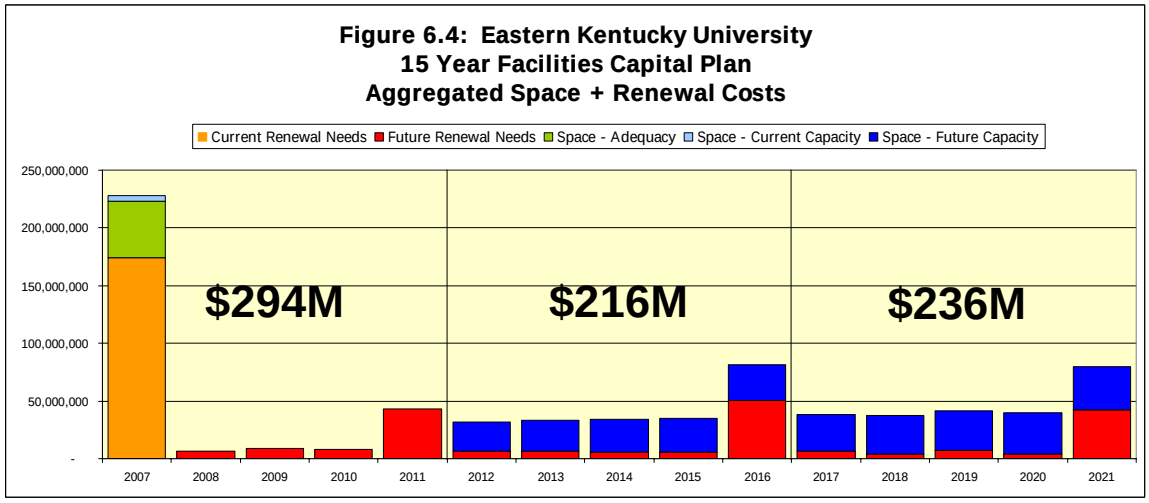


Figure 6.4: Eastern Kentucky University
15 Year Facilities Capital Plan
Aggregated Space + Renewal Costs
Current Renewal Needs
Future Renewal Needs
Space - Adequacy
Space - Current Capacity
Space - Future Capacity
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
-
$294M
$216M
$236M
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

Funding to Meet Strategic Goals

The consultants' team believes the spending pattern depicted in Figure 6.4 to be difficult to achieve – it is unlikely KPES and the institutions could mobilize the financial, facility planning and project management resources necessary to make such a high level of investment in year 1 of a 15 year plan.

Table 6.5: EKU 15-year Strategic Capital Investments

Data supports Figures 6.6 through 6.8. Note: In 2007 dollars, Inflation factor set to 0%.

Funding Year	Condition Needs	Space - Adequacy	Space - Current Capacity	Space - Future Capacity	Total Funding
2007	$ 29,089,000	$ 9,732,000	$ -	$ -	$ 38,821,000
2008	28,901,000	9,732,000	1,091,000	-	39,724,000
2009	29,749,000	9,732,000	1,146,000	-	40,627,000
2010	30,597,000	9,732,000	1,201,000	-	41,530,000
2011	31,446,000	9,732,000	1,255,000	-	42,433,000
2012	17,828,000	-	-	25,507,000	43,335,000
2013	17,456,000	-	-	26,783,000	44,239,000
2014	17,083,000	-	-	28,058,000	45,141,000
2015	16,711,000	-	-	29,334,000	46,045,000
2016	16,338,000	-	-	30,609,000	46,947,000
2017	15,966,000	-	-	31,884,000	47,850,000
2018	15,593,000	-	-	33,160,000	48,753,000
2019	15,221,000	-	-	34,435,000	49,656,000
2020	14,848,000	-	-	35,710,000	50,558,000
2021	14,476,000	-	-	36,986,000	51,462,000
	$ 311,302,000	$ 48,660,000	$ 4,693,000	$ 312,466,000	$ 677,121,000

ENDING 1-Year FCI = 10%

Further, while the 2007 backlog of deferred capital renewals, space adequacy and space capacity needs are real today, the dates for future renewals and capacity investments are only forecasts – the exact year each is required can be adjusted if aligned with careful maintenance practices and space use assignments. Thus, spreading the investment out is a reasonable, and practical, goal.

To best manage the capital investment, EKU should establish some high level programmatic goals for capital investments. The goals should represent a 'blended' approach to address all three causes for facilities investments: condition, adequacy and capacity. The consultants propose the following strategic capital funding goals:

1. **Fit-for-Use in 5 Years:**
   Bring all facilities up to Fit-for-Continued-Use standards within the first 5 years. (Table 6.5, green column, with spending averaged over 5 years.)

2. **All "Good" Condition within 10 Years:**
   Reduce the backlog of deferred capital renewals to 10% (all buildings in "good" condition) over the first 10 years, and maintain a 10% FCI thereafter. (Table 6.5 red column. Note this is less than "Actual Needs" shown in Table 6.1 because the investment is spread out over more years (rather than invest immediately when predicted the need with come due), and maintaining 10% FCI is a reasonable goal. (Maintaining 0% FCI is not reasonable.)

3. **Invest Regularly to Build Capacity:**
   Invest regularly to build space capacity, addressing current capacity needs over first 5 years (light blue) then, starting in year 6 (dark blue) growing with enrollment through year 15.

Table 6.8 summarizes the investment pattern required to meet the proposed strategic goals. (Note that the total spent for Condition is less than in Table 6.4, because Goal 2 allows for carrying forward 10% of the current replacement value in renewals.)

To meet the proposed strategic goals, the System's 15-year capital investment would be $677 million (in 2007 dollars, inflation = 0%).

Establishing funding needs that align with priorities this way will enable EKU to better access various funding sources, which are frequently targeted at specific initiatives or available at more favorable terms when pooled with similarly grouped needs from multiple Kentucky public postsecondary education institutions. Section 7 includes a more detailed discussion of funding sources potentially available to KPES and EKU.

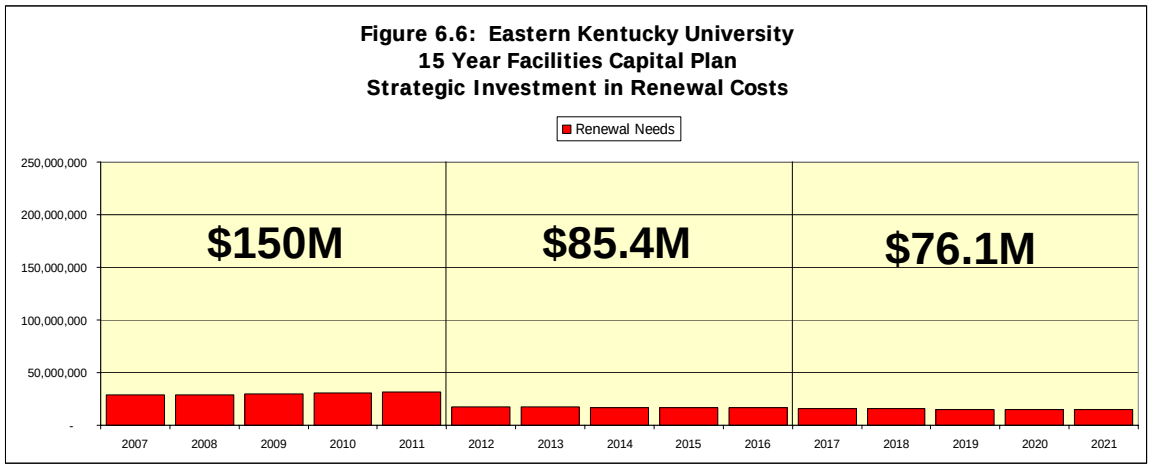


Figure 6.6: Eastern Kentucky University
15 Year Facilities Capital Plan
Strategic Investment in Renewal Costs
Renewal Needs
250,000,000
200,000,000
150,000,000
100,000,000
50,000,000
-
$150M
$85.4M
$76.1M
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

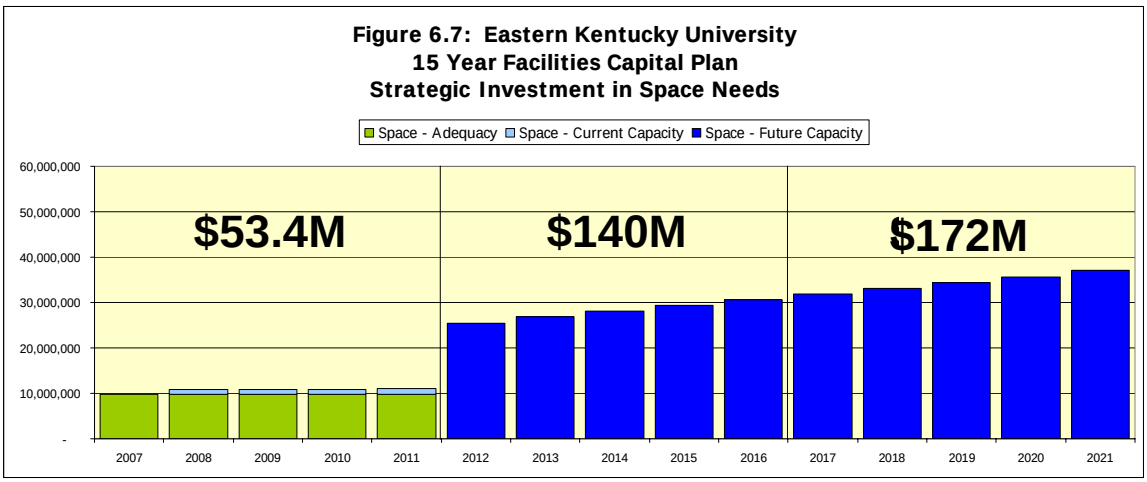


Figure 6.7: Eastern Kentucky University
15 Year Facilities Capital Plan
Strategic Investment in Space Needs
Space - Adequacy
Space - Current Capacity
Space - Future Capacity
60,000,000
50,000,000
40,000,000
30,000,000
20,000,000
10,000,000
-
$53.4M
$140M
$172M
2007
2008
2009
2010
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2016
2017
2018
2019
2020
2021

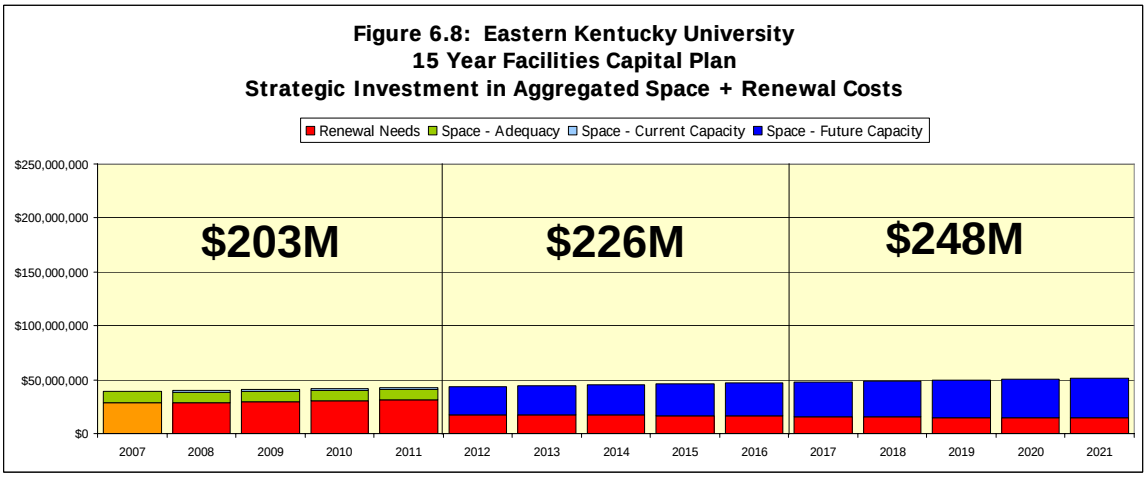
Figure 6.8: Eastern Kentucky University
15 Year Facilities Capital Plan
Strategic Investment in Aggregated Space + Renewal Costs
Renewal Needs
Space - Adequacy
Space - Current Capacity
Space - Future Capacity
$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$0
$203M
$226M
$248M
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

Section 7: Financing of Physical Facilities

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INTRODUCTION

Physical plant represents the primary asset of most institutions of higher education. Many facilities were built in response to the enrollment growth of the baby-boom generation. These buildings are now of an age where they need either replacement or considerable renovation if they are to meet current needs. In addition, programmatic additions and mission changes (such as increased emphasis on research) create needs for additional facilities even under conditions of enrollment stability. These factors, and likely others, create ongoing requirements for financial resources that can be devoted to replacement, renewal, or expansion of an institution's stock of physical assets.

This need for resources comes at a time when state governments, the primary source of capital funding for public institutions, are under considerable pressure to reduce tax burdens and/or to fund competing programs. This requires institutions to look further afield for sources of funds for capital projects. This brief white paper explores the array of alternatives and some of the financing mechanisms that are commonly employed. The paper employs a simple conceptual schema with three components:

- Potential Sources of Revenue
- Uses of Revenues
- Financing Mechanisms

The schema is shown diagrammatically in Table 7.1.

This schema reflects the realities that:

- Institutions have multiple sources that can be tapped for capital projects.
- Different sources are often aligned with different uses (the specifics in this regard will be explored later in the paper).
- There are different kinds of uses (renewal vs. new, auxiliary facilities versus general academics). Different finance mechanisms are often used with the financing of these different kinds of facilities.

Each of these dimensions will be explored in more detail in subsequent sections of this paper.

TABLE 7.1
The Dimensions of Financing Alternatives

USES	SOURCES					
	Students	State	Local Govt.	Federal Govt.	Donors	Institutional Funds
Renewal and Renovation New Construction • Auxiliaries • General Academic • Research	MECHANISMS					

THE ALTERNATIVE SOURCES OF FINANCING AND THE ASSOCIATED MECHANISMS

Colleges and universities obtain financing for facilities from a variety of sources. Chief among them are the following:

A. Students

Students have traditionally been a source of funding for certain college and university facilities, particularly those where there is a direct relationship between a funding stream and a provided service. The classic example is funding for dormitories and dining halls. In this case, room and board charges are almost always established in a way that allows the institution to repay bonds issued to pay for construction and/or to accumulate a reserve fund sufficient to pay the necessary costs of renewal and renovation.

Closely related are fees levied on all students for purposes of paying for construction of facilities. Typically such fees are used to pay for construction and renewal of facilities such as student unions and student recreation buildings. It is rare that such fees are collected for the purpose of constructing new academic buildings (and never research facilities). While the practice of using student fees to construct academic space is still not common, it is a practice that is gaining adherents. There are recent examples in which students have voted increases in fees in order to pay for badly needed campus instructional space. In the few instances to date in which students have paid for academic facilities at public institutions, the situations were unique, typically ones in which state funds were not available for a critically needed building. Student funding of a new Law School facility at the University of Colorado—needed to meet accreditation requirements at a time of state revenue declines—is a good illustration. This very nascent movement represents further recognition that students—not the state—are the dependable source of institutional revenues. This is explicitly the case regarding operating funds in the several states in which tuition revenues exceed state appropriations. With this precedent in place, there is no reason to believe that the practice will not evolve on the capital side as well.

It should be noted that funds obtained from students are acquired in ways (and at a rate) that make their use consistent with repayment of bonded indebtedness rather than up-front payment for construction or renovation.

B. State Governments

States have historically been—and continue to be—the primary provider of funds for the construction (and reconstruction) of academic buildings on college campuses. While institutions are always seeking to diversify sources of funds for capital projects, very few public institutions get to the point where states become the junior partner in such ventures. This situation is unlikely to change. Buildings are very tangible; legislators know quite precisely what they are getting when they appropriate funds for campus construction. Capital appropriations have at least two other attractive features:

1. They create (construction) jobs for blue-collar workers and thus spread the benefits across a wider swath of the citizenry.

2. They do not obligate the legislature to ongoing payments in the same way as do increases in appropriations for operating purposes. This feature explains why it is often easier to get funds for capital (one-time) expenditures than for increases in the operating budget.

The mechanisms used by states to provide funds for capital constructions vary over a relatively narrow range. On one side are states that adhere to a pay-as-you-go philosophy and appropriate funds in a lump sum to pay for construction (although the payment may be split with payment for planning being covered in one year's appropriation and actual construction in another). Other states are more prone to issue bonds to pay for campus capital projects. Some states (North Carolina, New Jersey) issue general obligation bonds that are backed by the full faith and credit of the state; the states, not the institutions, are responsible for repaying the debt. In other states, legislatures establish ground rules (and sometimes devices for pooling borrowing in the search for better rates) that let institutions borrow up to some predetermined limit. In such cases, institutions often must pledge tuition as collateral for the debt. While

the state is not directly responsible for the debt, there is recognition that, in case of institutional default, the obligation will likely end up on the legislative doorstep. With this in mind, the state's authorization to issue debt instruments is typically coupled with inclusion of repayment amounts in the operating budgets requested by, and appropriated to, the institutions.

C. Local Governments

In the main, only community colleges that have their own taxing authority have been in a position to acquire and use local tax revenues to pay for capital construction projects. The norm is a situation in which the state establishes an upper limit on the tax rate (almost always a real property mill levy) that can be imposed without a referendum approving an override. Given the nature of the revenue stream, these tax revenues are most frequently used to repay debt rather than being accumulated and utilized in a pay-as-you-go manner.

Recently, there has been a break in the tradition of local tax revenues being confined to use by community colleges having their own taxing authority. The City of Phoenix has successfully passed a tax referendum that will provide local tax support for the construction of a downtown campus for Arizona State University. As local governments increasingly recognize the value of institutions of higher education as "anchor tenants" in their downtown redevelopment efforts, there will likely be opportunities for such arrangements in other urban areas.

D. The Federal Government

In the 1960s, the federal government—through the Higher Education Facilities Act—was a major funder of academic facilities on college campuses. Those days are long since past. Now federal funds for capital projects are limited to facilities that are:

1. In direct support of a federal priority. This translates almost completely into support for the construction of special-purpose research facilities that will house activities of a very select nature (for example, research into different issues related to bio-terrorism).

2. Constructed as a result of Congressional earmarking. These appropriations can cover any type of facilities and are dependent solely on relationships with a Member in a position to "bring home the bacon" to an institution in his/her state or district. Since the level and nature of earmarking is causing considerable consternation in some quarters, this may be a funding mechanism that has reached its high-water mark.

E. Private Donors

For some public institutions—specifically those with large (and affluent) alumni bases and effective fund-raising offices—private donors have been, and will continue to be, important sources of financing for capital projects. Such support is typically found at major research universities; comprehensive universities and community colleges are much less likely to obtain major funding from such sources. Very few public institutions have an alumni base—and a history of success in tapping that alumni base for academic building support—to make this source a reliable one for most institutions. It takes a rare combination of a rich alum and common ground between donor and institutional need to bring such funding to fruition. Even when such funds are provided, they are much more likely to be focused on facilities normally not priorities of the state. Most donors would consider general academic buildings at public institutions to be a state responsibility.

Donors with the ability to provide substantial amounts of funds for capital projects will typically provide:

1. All the funding for a building, or

2. Funds that match those from another (type of) contributor—usually the state or federal government.

In almost all cases, they are interested in having naming rights for the building—they want either themselves or someone of their choosing to have their names inscribed in stone on the campus. This particular interest on the part of donors means that money from this source is rarely available for renewal and renovation projects; naming rights for existing buildings have long since been granted.

Accepting funds from private donors can create problems as well as benefits. It is not unheard of

for donors to provide funds for a building that is not a campus priority—or may not even be on the institution's radar screen. Institutions are hard-pressed to say "no" in such circumstances, but saying "yes" may cause friction within the institution and with the state over issues of funding the maintenance and operations of the building and the programs it is designed to house. Further, the gift may be for a priority project but come with complicating strings attached. A major gift for construction of a sports facility at the University of North Dakota came with the stipulation that the "Fighting Sioux" label on the sports teams be retained, a requirement that has put the University in a difficult position vis-à-vis the NCAA.

F. Institution's Own Funds

There are circumstances in which institutions can, and do, use undesignated general fund revenues to renovate or acquire academic buildings. This is particularly the case regarding renovation projects that are required but unfunded by other sources, specifically state governments. However, there are also instances in which campuses acquire new academic buildings using their own resources. Two instruments are favored under such circumstances:

1. Bonded indebtedness in which the "full faith and credit" of the institution lies behind the securities. This is little different from state bonds that must be repaid by institutions with the exception that there is less tacit understanding that state appropriations are made with repayment in mind. Another variation on this theme is the circumstance in which universities designate indirect cost reimbursement funds to pay off indebtedness on research facilities. Even in situations where this arrangement is utilized, special permissions may be requested from the state—or such arrangements may be included in the broader financing plan for major construction projects. This was the case for the financing of the new Health Science complex at the University of Colorado.

2. Lease-purchase arrangements in which the institution enters into a long-term lease arrangement with an owner with a provision that title transfers to the institution at some specified point in the future. This mechanism is easier to arrange for residential space since the owner can find an alternative use should the institution renege on its obligations. The more specialized the space, the more difficult it is to make a lease/purchase work—it is easier, for example, with general office space than with science laboratories.

Regardless of the instrument, these arrangements require a regulatory environment that allows institutions to engage in such practices. Such is not often the case; most states insist on prior approval that may or may not be granted under the premise that such actions are indirect means of obligating the state to future payments. The rules around this practice vary substantially from sate to state. They also require institutions to accept the responsibility of making the associated payments an annual budget priority—taking funds "off the top" of the annual budget—in the face of vagaries in funding streams for general institutional operations.

Perhaps the least constrained environment for use of institutional funds to repay borrowing for construction of academic buildings is in Arizona, where the state formulaically establishes a ceiling on borrowing and allows institutions to manage their own borrowing portfolios within the limits established.

MECHANISMS

In one way or another, all of the frequently used mechanisms were discussed in the prior section. This section serves to summarize the bits and pieces in a more orderly fashion. In reality there are only two generic mechanisms for supporting capital projects—outright purchase or acquisition through payments over time. The equivalent is paying cash or borrowing and repaying the loan.

The former is straightforward; the institution accumulates resources and pays for the capital project when the funds are accumulated. The funders who are in a position to support such an approach are state governments, the federal government, and private donors.

The case in which institutions essentially borrow funds and pay them off over time is only slightly more complicated. The basic instruments are either debt or lease/purchase arrangements.

There are numerous variations around the former:

- Whose obligation is it—the state or the institution?
- What is the nature of the collateral—full faith and credit or specific revenue streams (housing revenues, tuition, indirect cost recovery)?
- What is the recourse in case of default?
- What is the specific nature of the instrument—revenue bonds, tax anticipation notes, etc.?

While these are highly technical differences, the basics are fundamentally the same.

State practices vary enormously in this arena. Some states believe strongly in pay-as-you-go funding for capital construction and pay for most construction out of general fund appropriations for specific construction projects. Others rely heavily on state bond issues where the proceeds are utilized for campus construction projects and annual payments are made by the state. Massive bond issues in North Carolina and California are examples. Finally, there are states like Arizona that allow institutions to borrow (up to a limit) with repayment coming from the institutions' operating funds. Typically the state appropriations to institutions are structured with these repayment obligations in mind. The latter arrangement provides institutions with the most freedom; it also carries the most risk.

USES

As indicated in Table 1, there is but a limited number of different kinds of capital projects:

- Renewal and renovation projects
- New construction projects
  - Auxiliaries
  - General Academic
  - Research

The relationships between revenue sources and uses were noted in several instances in Section II but will be treated more systematically here.

A. Renewal and Renovation

In most states renewal and renovation projects take their place alongside new construction projects and get prioritized in competition with them. Projects dealing specifically with safety concerns frequently migrate to the top of the priority list while others slip to the bottom—a new building is much more attractive to funders than replacing steam lines or replacing the electrical system in Old Main.

The funders for such projects are predominantly the states, local taxing authorities (typically only for community colleges), and the institutions themselves, with the states being the primary source. They tend to use the same approaches—direct funding or debt—regardless of the type of project. One can make a very good case for shifting responsibility for renovation and renewal projects entirely to the institutions, leaving the state's capital projects appropriations to cover new construction projects. The rationale goes as follows:

1. The state (or some other funder) paid for the facility in the first instance; at that point it becomes the institution's responsibility. The state should not have to pay multiple times for the same facility.
2. Sound management practices would call for depreciation accounts (1½-2% of replacement value) that accumulate funds for renewal purposes. GASB accounting rules now require recognition of depreciation expense. Unfortunately such rules did not take effect until well into the useful lives of most buildings. The new rules help to avoid further accumulation of deferred maintenance liabilities. They do little to reduce the level of deferred maintenance that had occurred prior to the GASB reforms.
3. Use of set-aside funds puts establishment of priorities in the hands of the institutions where, many would argue, it rightfully belongs. Legislatures are not in a position to establish interinstitutional priorities for such projects.

4. Legislatures are much better equipped—and much more interested—in establishing priorities for new buildings.

The state of Missouri follows this policy (at least it did a few years ago). Under this policy the institution was obliged to spend the equivalent of the depreciation expense amount on renewal and renovation projects. The institutions selected the projects; their only obligation to the state was an accountability requirement indicating that the required funds had, indeed, been allocated to renewal projects.

In reality, institutions typically find ways to use their own funds only when needs become dire and funds are not forthcoming from the state (or any other source).

Sound practice with regard to funding renewal and renovation would have the following features:

- An explicit, system-wide determination of levels of deferred maintenance on each campus.

- A multi-year plan for the elimination (or significant reduction) of this backlog. This plan should be established as separate from financing for new facilities. The "cleanest" approach would be a state bond issue paid from general operating revenues and intended to remove R&R from the agenda as a state obligation.

- A requirement that an amount equal to GASB depreciation amounts be spent each year out of institutional operating funds on renewal and renovation projects. The institutions should make the selection of projects to be so funded. The accountability requirement should be that a) the institution has an annually updated list of R&R priorities, and b) funds in the amount of prior year's deprecation amount are expended on the highest priority items.

  Such a process, if implemented, would result in elimination of past accumulations of deferred maintenance and make the institutions, not the state, responsible for ensuring that deferrals do not accumulate in the future. Such a policy would also create disincentives for institutions to acquire additional facilities of marginal benefit or to hang onto facilities that might better be removed from the inventory. Finally, it would keep the focus of the capital process on new facilities—a focus consistent with legislators' interests and policy determinations and eliminate the confounding of policy decisions (new facilities) with ongoing operational decisions at the campus level. Kentucky would do well to consider such a policy.

B. New Construction Projects

1. Auxiliary Facilities

Construction of auxiliary facilities—residential and dining facilities—is almost always funded by students through direct use charges (room and board fees). If such use charges are insufficient, institutional funds are tapped as a last resort to fill the gap.

Construction of facilities such as student unions and recreation facilities are also typically paid for by students although the mechanism is almost always a broadly applied student fee rather than a use charge. For these types of facilities, private donors often contribute as part of a larger capital campaign. In some instances, states contribute directly to construction of such facilities.

In virtually all projects supported by student charges or fees, the instrument used is some form of long-term debt.

2. General Academic Facilities

The predominant funders of general academic facilities—classrooms, labs, offices, and libraries—are state and local governments and private donors. In rare instances students (through an imposed fee) and institutions themselves contribute. The federal government will participate only in the case of Congressional earmarks.

The instruments most likely to be used by the state are direct appropriations for construction of the building or debt instruments that are repaid by the state either directly or indirectly through annual appropriations to the

institutions. Conceptually, the most satisfying approach is likely to be one similar to Arizona, where the state establishes a borrowing cap for each institution and empowers the institution to borrow in its own name. This avoids much of the competition for funds borrowed through a centralized state pool. A compromise is to establish borrowing limits for each institution but bundle the bond offerings each year as a way of securing better rates than can be negotiated by each institution acting independently.

Donor contributions most often come in the form of outright gifts.

3. Research Facilities

The primary funders of research facilities are state and federal governments and private donors (either individuals or philanthropic organizations). Funds from the latter two providers most frequently come in the form of lump-sum contributions. Funds from states follow the same pattern as funding for other academic facilities—in some states it is direct, pay-as-you-go appropriation. In other states, funds are provided through issuance and repayment of debt instruments. States fund research facilities in much the same way as they fund other academic facilities. Pay-as-you-go states maintain this practice for research facilities. States that borrow for general academic space also borrow for research facilities. To the extent that there are variations, they take the form of:

a. The state providing a challenge grant that leverages the capacity of the institution to generate funds from private sources.

b. Comprehensive financing plans for truly large undertakings such as the multi-billion dollar Health Services Campus at the University of Colorado.

SUMMARY

Reverting to Table 7.1 and filling in the blanks, primary funding patterns for higher education facilities are predominantly as indicated in Table 7.2.

While there are exceptions in almost all instances, the summary in Table 7.2 represents the weight of practice.

TABLE 7.2
Primary Funding Patterns for Higher Education Facilities

USES	SOURCES					
	Students	State	Local Govt.	Federal Govt.	Donors	Institutional Funds
Renewal and Renovation	—	Approp./debt	—	—	—	Approp./debt
New Construction						
• Auxiliary						
– Residential/dining	Use charges	—	—	—	—	—
– Recreation	Fees	Approp./debt	—	—	Gifts	—
• Academic facilities	Fees	Approp./debt	Debt	—	Gifts	Lease/purchase
• Research facilities	—	Approp./debt	—	Grants	Gifts	—

Table 7.3 below is presented as a worksheet for EKU.

Here, the subtotals of the "Strategic Funding" scenario suggested in Section 6.8 are shown in the "Amount Needed, from 2006 Study" column.

KPES and EKU policy makers can use Table 7.3 as a framework to allocate the Amounts Needed across the most likely sources of funds to create EKU's 15 Year Funding Plan.

If EKU chooses to supplement this study with additional information, any additional capital investments identified would need to be included.

TABLE 7.3
EKU Funding Patterns Worksheet for Higher Education Facilities

USES		SOURCES					
	Amount Needed, from 2006 Study	Students	State	Local Govt.	Federal Govt.	Donors	Institutional Funds
Renewal and Renovation							
• Condition/End of Life	$311m		Approp./debt				Approp./debt
• Space Adequacy	$48m		Approp./debt				Approp./debt
New Construction							
• Auxiliary	n/a						
2006 Capacity							
• Academic facilities	$5m	Fees	Approp./debt	Debt		Gifts	Lease/ purchase
• Research facilities	$0m		Approp./debt		Grants	Gifts	
2020 Capacity							
• Academic facilities	$312m	Fees	Approp./debt	Debt		Gifts	Lease/ purchase
• Research facilities	$0m		Approp./debt		Grants	Gifts	
• TOTAL	$677m						

Section 8: Recommended Next Steps

The VFA | Paulien | NCHEMS team recommends KPES and EKU work closely together to align each institution's capital needs with its strategic priorities for the coming 15 years. The following steps should be considered to help complete the picture that this study has started to paint, and well position the Commonwealth's public postsecondary education system as a national leader in stewardship of its facilities:

1. **Establish strategic goals for the 15-year capital plan**, possibly broken down into three 5-year periods. The strategic goals may go beyond those considered or recommended in this study, such as a new emphasis on building research capacity, a residential campus or other programmatic goals specific to the institutions.

2. **Complete the data** so that the 15-year plan includes ALL assets. There are various ways to establish or estimate the investments needed to address condition and space needs for the facilities not yet studied, including more facility condition assessments, further sampling and extrapolating condition or space results of similar buildings, or pure modeling based on age and use profiles of buildings yet to be studied.

3. **Integrate all capital planning data into central records** for each asset, and maintain those records to reflect recent changes (improvements or degradations). Records should be stored in capital planning and management software that makes strategic planning, spend management, and progress tracking easy.

4. **Fund according to needs –** as established in this and subsequent studies. "Needs based funding" can serve as a defensible, transparent way to allocate funds while addressing any past capital investment inequalities among the institutions, or on any particular campus. Funding allocated by percent of student population or annual increases to historical distributions tend to perpetuate past inefficiencies.

5. **Pool institutional capital needs** with similar needs from other Kentucky postsecondary education institutions, to facilitate better sources and financial terms for those funds. For example, to consider one possible funding source, the Legislature might fund (from appropriations or another source) all roof projects statewide in one budget cycle, or issue a bond for building new research facilities across multiple institutions.

It is the consultants' strong belief that the Kentucky Postsecondary System and Eastern Kentucky University have already made a wise investment in their facilities through this study, which should serve as the basis for well-informed capital decisions that will help EKU and the Commonwealth achieve their 15 year goals.

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