

## Case Study: State-Wide University Systems

By Kyle Christiansen

### Universities are facing challenges of competing priorities that make capital planning and budgeting more challenging in 2023.

What is your priority for 2023?

1. Deferred Capital Renewal
2. Renovation
3. Remodeling
4. Expansion or New Construction
5. Down-sizing or Repurposing
6. Repositioning systems to meet Net-Zero energy goals

If you could take a deep dive into your college or university campus, what would you find? I am currently working with a mid-western university with over 600 facilities. This university system is not only trying to address the deferred capital renewal and maintenance but now is facing a mandate for a comprehensive overhaul of all heating, cooling, ventilation, and electrical systems to create a carbon neutral future. How do you balance these competing priorities on today's college campuses? Since this is a statewide university system, campuses and colleges throughout the state are vying for the same funding sources. Roth IAMS provides facility condition reporting and a centralized capital planning software program to build funding priorities for the many competing agendas throughout the state and between competing college programs.

#### CASE STUDY:

State universities have a unique challenge of managing diverse facilities, multiple campuses, competing departments, and increasing deferred maintenance priorities. As an example, a few years ago, I assessed another state university campus with 200 facilities. This campus had a 200 - year history of construction, dating back to a seminary started in the 1820s. Today, they have an enrollment of nearly 35,000 students. The scope of work included:

1. Detailed ADA study
2. Asset Inventory that included data capture and bar-coding thousands of pieces of equipment
3. Detailed FCA – capital planning report for each facility.

This university had a long history of growth and expansion. Today's facilities were being thrown up quickly and cheaply. Older buildings were being repurposed or disposed of. Middle-aged buildings were targets for renovation. Remodeling was an ongoing process for almost all of the buildings. Of note, the original student union building is currently being used as a library. This building is not structurally adequate to store books, so all

## Case Study: State-Wide University Systems

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book stacks are located in the basement. Several of the campus buildings had out-lived their original purpose and were candidates for repurposing or deposition. The history of campus expansion included:

### UNIVERSITY GROWTH AND DEVELOPMENT:

The university was originated in 1818, and the structures represent 200 years of construction practices and architectural styles. The following is an overview of the years of expansion that has brought the university to its current configuration:

1818 Seminary established

1827 College established

1832 Seven bldgs. constructed

1. 2 facilities
2. 2 dormitories
3. 1 laboratory
4. 1 hotel
5. 1 rotunda

1838 Engineering school added

1841 President's mansion added

1859 Enrollment 126 students

1860 Military school est. Enrollment increases to 154 students

1865 School burned by Union soldiers 1871

Enrollment drops to 107 students 1872 Law school established.

1881 Civil Engineering School est.

1892 Football team est.

1893 Women enroll

1901 Enrollment = 696 students 1903

Military school abandoned

1903 Fund raising and expansion

1909 College of Engineering and Education

## Case Study: State-Wide University Systems

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1911 Enrollment increases to 571 students 1919

School of Commerce est.

1920 Medical College est.

1921 Enrollment increases to 2,134 students

1931 School of Economics

1941 Enrollment increases to 4,921 students

1945 Medical school moves off campus

1951 GI Bill

1956 African Americans enroll

1961 Enrollment increases to 8,257 students 1965

School of Social Work est.

1968 School of Computer Science est.

1969 Grad School Library const.

1971 College of Community Health est. Enrollment increases to 13,155 students

1973 School of Communication

1978 School of Nursing

1983 College of Continuing Studies

1991 Enrollment increases to 19,366 students

1998 Fund raising campaign \$12.6M Enrollment increases to 22,411 students

1998 82,000 seat stadium constructed

2003 College of Community Health2011 Manufacturing Department  
created with new facilities

2013 Enrollment increases to 34,852 students

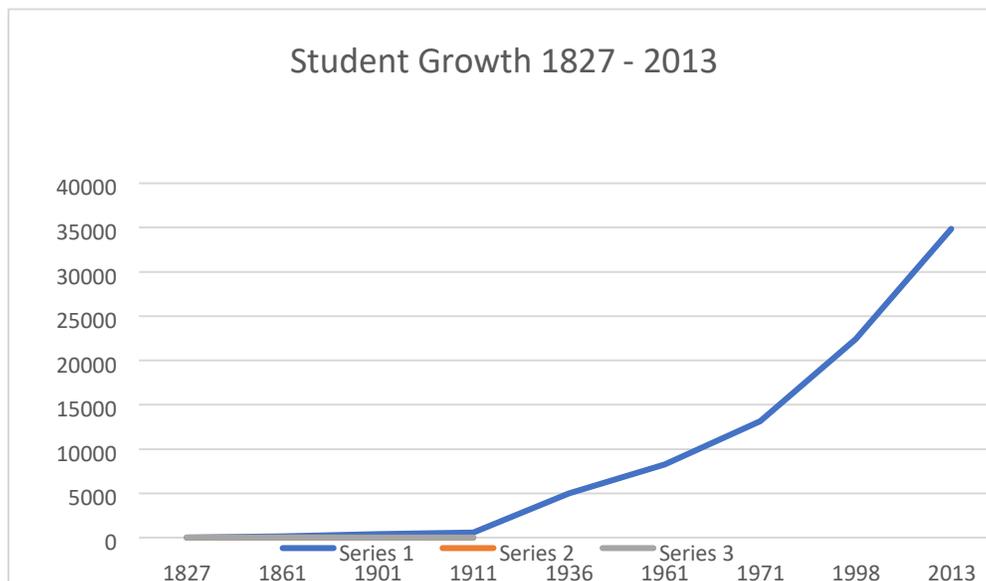
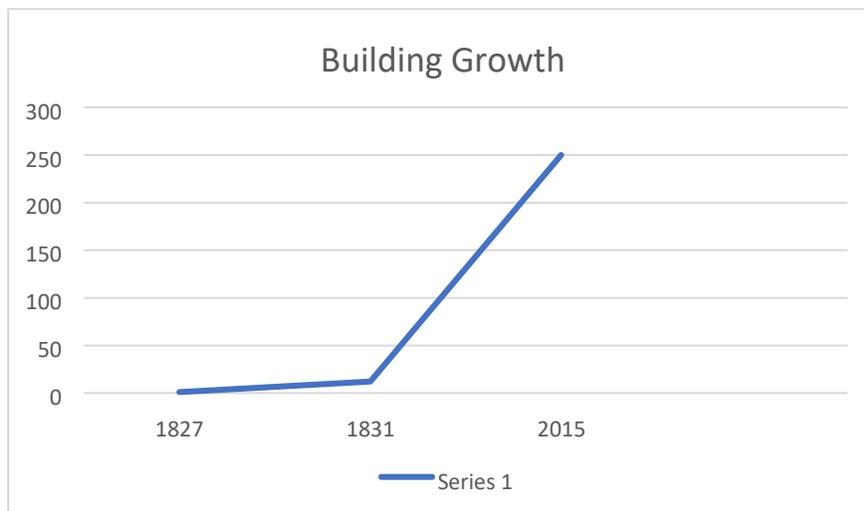
## Case Study: State-Wide University Systems

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### CHALLENGES OF UNIVERSITY FACILITY MANAGEMENT:

Facility managers have a next to impossible task of setting budgets, setting priorities, asking for funding, and reconciling the actual work with the actual costs. As facilities age, questions change from maintenance to remodeling, to renovation, to addition and expansion. Then the cycle starts over until the facility finally reaches the end of its effective utilization. The next step is demolition or repurposing.

Does this look like your institution? Have you seen a parabolic rise in enrollment over the last 100 years? Have you seen rapid growth in facility construction over the last 200 years? Now that it's 2023, what does your future look like. The following charts are actual growth charts for the 200 year old campus that I described above:



## Case Study: State-Wide University Systems

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### OPPORTUNITIES CREATED BY FACILITY CONDITION ASSESSMENT:

The way to address the capital planning questions starts with a comprehensive study that includes:

1. Building out an FCI, Facility Condition Index for each facility, comparing expected capital investment with the construction costs of a new facility.
2. Building out priorities of system replacement and renewal. Capital renewal costs must be divided into immediate, short term, and long-term projections.

These cost projections are predicated on building a data base of defensible data. Defensible data required a valid cost library, an accurate identification of systems, an accurate set of quantity take offs, and a consistent set of trained eyes that bring consistency and accuracy to the collection of element and system data.

Once the data is collected, it must be organized into categories such as energy, ADA, Code, Life Safety, Critical condition priorities for immediate and short term priorities or into a long term projection of future replacements based on Effective Useful Life (EUL) and Remaining Useful Life (RUL). With all of these priorities, the projected budgets can be rolled up into a FCI index, that projects estimate capital investment requirements vs. the cost of new construction.

These data points allow a macro look into the facilities that help to predict remodeling, renovation, and demolition investments. If energy or space utilization studies are included, these studies can hasten or completely challenge the standard capital planning of replacement in-kind. Energy enhancements or adaptive reconfiguration of building usage can significantly challenge the status quo.

As if the prevailing challenge of addressing deferred capital investment and maintenance wasn't enough, now a whole new set of priorities is challenging the status quo. Roth's Integrated Asset Management approach to Facility Condition Assessment helps to identify issue, prioritize planning, synchronize the coordination of complementary objectives such as renovation and renewal priorities.

#### 1. ISSUES IDENTIFIED BY FCA STUDY – Campus-wide

- a. ADA priorities – discuss accessibility budget and challenges
- b. Renovation targets – discuss renovation budget and challenges
- c. Renewal priorities – discuss scheduling and prioritizing challenges
  - i. Roofing
  - ii. HVAC systems
  - iii. MEP systems
  - iv. Fire Safety
  - v. Pavement

## Case Study: State-Wide University Systems

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- vi. Carpeting/Flooring
  - vii. Windows
  - viii. Landscaping
  - d. Energy Priorities
  - e. Code Priorities
  - f. Student Priorities
    - i. Housing refurbishments
  - g. Staff Priorities
    - i. Departmental priorities
- 2. ISSUES IDENTIFIED THAT CHALLENGED DEFENSIBLE DATA**
- a. Data consistency – Making sure EULs for building systems and age is consistent
  - b. Lack of historic records – adding historic information to the data base
  - c. Cost library consistency – reducing cost library
  - d. Data management – keeping up with renewals and data update
- 3. ISSUES WITH CONSTRUCTION COST FLUCTUATIONS**
- a. Renovation cost inflation
- 4. MAINTENANCE STAFF RETENTION**
- a. Issues with retiring staff challenging institutional knowledge
- 5. QUALITY OF BUILDING CONSTRUCTION**
- a. Issues with rapid construction of dormitories in 2005
- 6. COVID 19 CHALLENGES**
- a. Delays in renovation and renewal
  - b. Changing demographics of students
  - c. Changing levels of in-person vs. remote learning.

If you are challenged by these challenges of managing facilities at your university or college, you are not alone. Roth's Integrated Asset Management Strategies provides the resources to build defensible data and a centralized database with capital planning software.

Check us out at [Rothiams.com](http://Rothiams.com)