2016 State of Facilities in Higher Education
Agenda

> Introduction to Sightlines

> Key Findings

> 2016 State of Facilities Trends

> Strategies for Success
Protect the Real Prize...

The average endowment

The average building replacement value
✓ Identify ways to use capital more strategically and identify opportunities to improve operational effectiveness.

✓ Separate fact from fiction on key issues – operational performance, annual funding needs, and project backlogs.

✓ Document trends, provide consistent measurement, credible benchmarking and track progress to goals.
Comprehensive Facilities Intelligence Solutions

- **BUILDING PORTFOLIO SOLUTIONS**
  Defining facilities needs & capital plans

- **SPACE UTILIZATION SOLUTIONS**
  Making the most of your largest asset

- **SUSTAINABILITY SOLUTIONS**
  Expanding your environmental stewardship

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With ROPA+ as the foundation, take your facilities data deeper with more targeted assessments using Sightlines’ Strategic Facilities Solutions
Who We Serve

Robust membership and growing database provides experience and perspective

Over 450 colleges & universities receive
Sightlines facilities intelligence annually

Partners to the Nation’s Leading Institutions:

- 14 of the Top 20 Colleges*
- 15 of the Top 20 Universities*
- 35 Flagship State Universities
- 14 of the 14 Big 10 Institutions
- 8 of the 12 Ivy Plus Institutions
- 8 of 13 Selective Liberal Arts Colleges

More than 100 new members since 2013

Rentention rate consistently above 92%

Sightlines serves more than 325 ROPA members across over 40 states

Serving state systems in:

- Alaska
- California
- Connecticut
- Hawaii
- Maine
- Massachusetts
- Minnesota
- Missouri
- New Hampshire
- New Jersey
- Oregon
- Pennsylvania
- Texas
- West Virginia

* Based on U.S. News & World Report rankings 2015

Largest verified database of facilities metrics, including:

- 1 billion GSF in over 40,000 buildings
- $6.5 billion in operating budgets
- $9 billion in capital project expenditures
Aligning Finance and Facilities in Higher Education

Looking at space, capital, and operations together leads to successful facilities strategies

- Average Campus Renovation Age: 35
- Total database Capital Investment: $4B
- Total database Operating Expenditures: $5.4B
The State of Facilities Database

Robust membership includes colleges, universities, consortiums and state systems

Serving the Nation’s Leading Institutions:
- 70% of the Top 20 Colleges*
- 75% of the Top 20 Universities*
- 34 Flagship State Universities
- 14 of the 14 Big 10 Institutions
- 9 of the 12 Ivy Plus Institutions

* U.S. News 2016 Rankings

<table>
<thead>
<tr>
<th>Sightlines Database</th>
<th>2015</th>
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<tbody>
<tr>
<td>Total Institutions</td>
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<tr>
<td>Public Institutions</td>
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<tr>
<td>Private Institutions</td>
<td>155</td>
</tr>
<tr>
<td>Comprehensive Doctoral Institutions</td>
<td>128</td>
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<td>Research Institutions</td>
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<tr>
<td>Small Institutions</td>
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<td>40K+</td>
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<tr>
<td>Total Students</td>
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Introduction to Key Findings

What are the latest facilities challenges in higher education?

Deferred maintenance backlogs are significant across all types of institutions and conditions exist for continued growth.

The three main areas that are contributing to the growth of deferred maintenance are:

- A significant amount of existing space was constructed during a period of rapid, poor quality construction
- Most buildings have received insufficient capital funding to slow down the backlog as they have aged
- The recent emphasis on constructing new space is directly competing for capital investment that could have been used for updating existing facilities.

These conditions are being impacted by a slowing of enrollment growth at many campuses and by flat budgets for facilities operations.
Space Profile
Space Growing Faster Than Enrollment in 2014 and 2015

Space and Enrollment Trends

National Average

Percent Change

Year

2007
2008
2009
2010
2011
2012
2013
2014
2015

Space

Enrollment
Space and Enrollment Growth – Public vs. Private

Space and Enrollment
Public Institutions

Space and Enrollment
Private Institutions
Campuses Becoming Less Dense with Low Utilization Rates

Density Factor Across the Sightlines Database

- The database average for Density has decreased by 5% over the past 5 years.
- The average classroom utilization rate is 50%-60%

*Density Factor measures the number of faculty, staff and students FTEs on campus per hundred thousand square feet.*
“One side effect of this rapid growth has been the creation of an increasingly large obligation for the future renewal and replacement of the physical plant.”

Rick Biedenwig – 1980
Founder, Pacific Partners Consulting Group

Source: Before the Roof Caves In II: Published with assistance from APPA and Stanford University
Act Your Era – Not Your Age

Pre-War
- Built before 1951
- Durable construction
- Older but typically lasts longer

Post-War
- Built between 1951 and 1975
- Lower-quality construction
- Already needing more repairs and renovations

Modern
- Built between 1975 and 1990
- Quick-flash construction
- Low-quality building components

Complex
- Built in 1991 and newer
- Technically complex spaces
- Higher-quality, more expensive to maintain & repair

Constructed Space 1880-2015

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- Built before 1951
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- Older but typically lasts longer

Post-War
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Complex
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Sightlines Database
Constructed Space Over Time

Campuses constructing equal amounts of academic and non-academic space

% of GSF by Type of Space

Sightlines Database - Construction Age
- Academic
- Non-Academic
Putting Campus Building Age in Context

Pre-War
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- Older but typically lasts longer

Post-War
- Built between 1951 and 1975
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Modern
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Sightlines Database - Construction Age
- Pre-War: Built before 1951
- Post-War: Built between 1951 and 1975
- Modern: Built between 1975 and 1990
- Complex: Built in 1991 and newer

Sightlines Database - Renovation Age
Square Footage by Age Category

Progress in balancing campus age profile

Construction Age vs. Renovation Age

% of Space

- **Buildings Under 10**: Little work. “Honeymoon” period. Low Risk
- **Buildings 10 to 25**: Short life-cycle needs; primarily space renewal. Medium Risk
- **Buildings 25 to 50**: Major envelope and mechanical life cycles come due. Higher Risk
- **Buildings over 50**: Life cycles of major building components are past due. Failures are possible. Highest risk

### Buildings Under 10
- Construction Age: 13%
- Renovation Age: 19%

### Buildings 10 to 25
- Construction Age: 18%
- Renovation Age: 26%

### Buildings 25 to 50
- Construction Age: 31%
- Renovation Age: 30%

### Buildings over 50
- Construction Age: 38%
- Renovation Age: 25%
### Capital Investment in Existing Space

Steady investment levels with continued improvement in annual capital funding

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<th>Annual Capital</th>
<th>One-Time Capital</th>
<th>Average</th>
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<td>$3.10</td>
<td>$3.10</td>
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<tr>
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<td>2009</td>
<td>$1.28</td>
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<td>2014</td>
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<td>2015</td>
<td>$1.73</td>
<td>$3.32</td>
<td>$3.07</td>
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**Note:** The average capital investment for the years 2007-2015 is $3.07 per GSF.
Capital Investment in Existing Space

Reliance on annual institutional capital growing for both public and private institutions
Facilities Backlogs Continue to Rise

The Sightlines backlog total includes maintenance/repair, modernization and infrastructure.
Facilities Backlogs Continue to Rise

The Sightlines backlog total includes maintenance/repair, modernization and infrastructure
Facilities Operating Budget

Small increases in campus operating budgets from 2007-2015

Facilities Operating Budget $/GSF

$0.00 $1.00 $2.00 $3.00 $4.00 $5.00 $6.00
$/GSF


$3.98 $4.26 $4.33 $4.37 $4.41 $4.44 $4.54 $4.65 $4.74

Daily Service  Planned Maintenance  Inflation
Facilities Operating Budget

Public vs. Private

Public Institutions

Private Institutions

$/GSF

$0.00 $1.00 $2.00 $3.00 $4.00 $5.00 $6.00


$/GSF

$0.00 $1.00 $2.00 $3.00 $4.00 $5.00 $6.00


Daily Service  Planned Maintenance
Custodial Coverage Rates Flatten in 2015

Custodial Coverage
GSF per FTE

National Average
Public Average
Private Average

Total GSF/FTE
Maintenance Coverage Rates Start to Level Off

Maintenance Coverage

GSF per FTE

National Average

Public Average

Private Average

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Total GSF/FTE
Modest Energy Reductions Since 2007

Energy Consumption

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<th>Year</th>
<th>Fossil</th>
<th>Electric</th>
<th>Percent Change</th>
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<td>82,251</td>
<td>51,196</td>
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<td>2008</td>
<td>83,320</td>
<td>52,788</td>
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<tr>
<td>2009</td>
<td>78,403</td>
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<td>2013</td>
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<td>2014</td>
<td>76,834</td>
<td>51,553</td>
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<tr>
<td>2015</td>
<td>72,740</td>
<td>50,487</td>
<td>-2%</td>
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Fuel Switching Driving Down Energy Costs

Energy Unit Cost

<table>
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<tr>
<th>Year</th>
<th>Fossil</th>
<th>Electric</th>
<th>Percent Change</th>
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<tr>
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<td>6%</td>
</tr>
<tr>
<td>2015</td>
<td>$8.45</td>
<td>$28.21</td>
<td>8%</td>
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</table>

- Fossil
- Electric
- Percent Change
Summary of Trends & Strategies
Summary of Trends

The aging campus is driven by the need to renovate or replace 1960s and 70s buildings, many of which were poorly constructed.

To add to the problem, campuses have added new, more complex square footage to address increasing enrollment that has now leveled off or is even in decline.

The combined demand for both “catch up” on aging buildings and “keep up” of newer buildings is much higher than the availability of capital funding.
Therefore, backlogs continue to grow even though capital funding is back to pre-recession levels, not adjusted for inflation.

Flat operating budgets have not provided relief to the backlog problem, although there are signs of improvement.

Modest improvements in energy consumption. Fossil fuel costs have declined primarily driven by shift to natural gas.
What are Campuses Doing to Manage Backlog & Reduce Risk?

By aligning space, capital, and operations strategies

**Lower Capital and Operational Demands** - Improve space management; eliminate buildings in poor condition; create a more balanced age profile; improve classroom utilization if enrollment is flat or declining.

**Make the Problem “Smaller” for Campus Decision-Makers** – Understand that campuses are a collection of assets that can be managed as an investment portfolio; funding is finite, but all buildings are not equal.

**Make a Greater Impact with Capital Funding** – Create multi-year capital plan for steady annual investment; target capital to safety, reliability and critical program needs; track data that show improvements to make the case for more funding.

**Manage Operational Resources** – Allocate daily service and planned maintenance time depending on condition and importance of building. Communicate standards for new service levels to campus community.
Make the Case for Additional Resources

The old approach of defining needs in a way that makes the DM problem bigger and then requesting money will not work.

*Time can be an asset* if you manage space, capital and operational resources properly. You can target critical renovations and postpone work without increasing risks of systems failure.

*Use data and metrics* to show the capital and operational costs of adding new space without eliminating existing space in poor condition.

*Demonstrate success* from managing space, capital and operations in an integrated way. Use the data and actions to make the case for additional funding.
Five Strategies for Success
Less Can be More
New Policies to Control Overhead

> “No Net New Space” – A policy rooted in sustainability, it states that no new space on campus will be built without the removal of an equal amount of deficient square footage.

> “No Net New Backlog” – A variation of no net new space that states that no new construction can occur without the mitigation of an equal value of backlog.
Tracking Backlog Progress Since 2005

24% decrease in building needs

Millions

<table>
<thead>
<tr>
<th>Year</th>
<th>Building Needs</th>
<th>Infrastructure</th>
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<tr>
<td>Original IFP</td>
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<td>Dec. 06 Update</td>
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<td>April 09 Update</td>
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<td>Fall 09 Update</td>
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<td>FY09 ROPA Analysis</td>
<td>$1,831</td>
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<td>June 2010 Update</td>
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<td>$82</td>
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<td>$1,607</td>
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<tr>
<td>June 2013 Update</td>
<td>$1,497</td>
<td>$77</td>
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Look Ahead
Unique Campus Age Profile

- **Buildings Under 10**: Little work, "honeymoon" period. Low Risk
- **Buildings 10 to 25**: Lower cost space renewal updates and initial signs of program pressures. Medium Risk
- **Buildings 25 to 50**: Life cycles are coming due in envelope and mechanical systems. Functional obsolescence prevalent. Higher Risk
- **Buildings over 50**: Life cycles of major building components are past due. Failures are possible. Core modernization cycles are missed. Highest risk

### Breakdown by Age

- **Construction Age**
  - Under 10: 25%
  - 10 to 25: 45%
  - 25 to 50: 31%
- **Renovation Age**
  - Under 10: 21%
  - 10 to 25: 45%
  - 25 to 50: 34%
- **Peer Renovation Age**
  - Under 10: 22%
  - 10 to 25: 23%
  - 25 to 50: 24%
Approx. $45M to be Due in 5 Years

Total identified needs by priority

- Priority 1: Currently Critical, Immediate
- Priority 2: Potentially Critical, Year 1
- Priority 3: Necessary - not yet critical, Years 2 to 5
- Priority 4: Recommended, Years 6 to 10
- Priority 5: Does not meet current codes/standards

<table>
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<th>Priority</th>
<th>Total Needs</th>
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<td>Priority 3</td>
<td>$42.5M</td>
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<tr>
<td>Priority 4</td>
<td>$12.0M</td>
</tr>
<tr>
<td>Priority 5</td>
<td>$486.7K</td>
</tr>
</tbody>
</table>

Majority of priority 1 projects already addressed

$196.5K
$2.1M
$42.5M
$12.0M
$486.7K

$ Millions

Electrical
Fire/Life Safety
Site
HVAC
Exterior
Health
Interior Finishes/Systems
Vertical Transportation
Plumbing
Accessibility
Build Strategically
Sample: Nearly Double Peers’ Users

7,500
More users on campus versus peer campuses

Sightlines Database – Density Factor
Insufficient Classroom Space?

Room Utilization – General Classrooms

Difficult Scheduling During Most of Day
Functional Obsolescence is the Real Issue

Many Small Courses, Few Small Rooms

Distribution of Rooms

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<thead>
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<th>Room Capacity</th>
<th>Fall '13 Enrollment</th>
<th>Spring '14 Enrollment</th>
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<td>41%</td>
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<td>23%</td>
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<tr>
<td>31-35</td>
<td>29%</td>
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<tr>
<td>36-40</td>
<td>4%</td>
<td>9%</td>
</tr>
<tr>
<td>40+</td>
<td>17%</td>
<td>1%</td>
</tr>
</tbody>
</table>

sightlines
Build Strategically

repair
Today: No Integration in the Process

- Fails to harness operating knowledge
- Does not tie to mission, strategy or master plans
- Ignores financial capacity
- Misses opportunities to optimize capital resources

Traditional Facilities Assessment
**Technical Assessment:** Conduct Building walkthroughs and component inventory to develop initial list of needs.

**Step 1: Integrate Technical Needs**
Integrate operational perspective to target inspections and reduce overall capital needs.

**Step 2: Create Building Portfolios**
Segment the backlog and tie projects to mission and institutional strategy.

**Step 3: Develop Multi-year Capital Plan**
Create outcome based strategies by portfolio.

**Step 4: Project Section**
Pick projects that support mission, operations, and financial capacity.
Example: Blended Functional and Investment Portfolios

Aligning needs with funding opportunities

- **Total Needs**: $253.9M
  - **New Construction**: $83.3M
  - **Grounds & Infrastructure**: $11.3M
  - **Building Needs**: $158.3M

**Institutionally Funded**
- **Academic**: $41.7M
- **Administrative**: $18.9M
- **Potential Grants**
- **Potential Gifts**
- **Potential to Sell**
- **Potential Gifts**

- **Sci./Research**: $33.9M
- **Athletic**: $11.6M
- **Residence Halls**: $18.0M
- **Faculty/Staff Housing**: $10.9M
- **Fraternities & Sororities**: $9.0M
- **Transitional**: $14.2M

**Focus investment into core campus facilities that are unlikely to receive donor funding**
Keep Up
The Multiplier Effect of Reinvested Savings

$1 Invested in Planned Maintenance

Equals

...$2.70 in Annual Operating Costs

Another investment impact is...

$1 Invested in Stewardship*

Equals

...$3 in Capital Backlog Need

* Stewardship is the annual investment into campus facilities
Reward Savings
Low Energy Consumption Keeps Dropping

Increase in PM supports lower energy consumption

Among the top 10% of lowest consuming institutions in Sightlines’ database

19% decrease

6% decrease
Increasing Focus on Systems, Envelope, & Infrastructure

Project Spending Mix

- Building Systems: 35%
- Envelope: 24%
- Infrastructure: 20%
- Space Renewal: 10%
- Safety/Code: 11%

Project Spending $/GSF

<table>
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<tr>
<th>Year</th>
<th>Building Systems</th>
<th>Envelope</th>
<th>Infrastructure</th>
<th>Space Renewal</th>
<th>Safety/Code</th>
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Legend:
- Building Systems
- Envelope
- Infrastructure
- Space Renewal
- Safety/Code