A Vocabulary for Measurement

The Return on Physical Assets – ROPA\textsuperscript{SM}

The annual investment needed to ensure buildings will properly perform and reach their useful life “\textit{Keep-Up Costs}”

The accumulated backlog of repair / modernization needs and the definition of resource capacity to correct them “\textit{Catch-Up Costs}”

Annual Stewardship

Asset Reinvestment

The effectiveness of the facilities operating budget, staffing, supervision, and energy management

The measure of service process, the maintenance quality of space and systems, and the customers opinion of service delivery

Operational Effectiveness

Service

The University of Alabama’s FY13 ROPA Radar Chart

- Annual Stewardship
- Asset Reinvestment
- Operating Effectiveness
- Service

Optimal  Target  Actual
Comparison Institutions

To be used in benchmarking

- Clemson University
- Florida State University
- Georgia Institute of Technology
- Rutgers University
- The Ohio State University
- The Pennsylvania State University
- University of Oregon
- Virginia Commonwealth University
- Louisiana State University
- Mississippi State University
- The University of Mississippi
- The University of Tennessee
- University of Arkansas
- University of Florida
- University of Kentucky
- University of Missouri

Comparative Considerations
Size, technical complexity, region, geographic location, and setting are all factors included in the selection of peer institutions.
The University of Alabama’s Facilities Department maintains the entire campus – E&G, Housing & Athletics. Sightlines breaks out each portion of campus to create space specific comparisons. For this presentation we focus on comparisons between Alabama’s E&G space vs peer E&G space unless otherwise noted on the slide.

Alabama’s Facilities takes care of:
- 6.8M GSF in E&G
- 4.3M GSF in Housing
- 2.2M GSF in Athletics
- 1,000 maintained acres
  - Excluding Bryce
About Sightlines Data Collection & Benchmarking

- In order to provide the best “apples to apples” comparisons Sightlines benchmarks sections of campus against the same sections of campus at other institutions.
  - E&G vs E&G (public)
  - Housing vs Housing (public)
  - Total Campus vs Total Campus
- Sightlines ties the resources (both human and financial) to the space the resources are utilized
- For certain metrics (energy & grounds) most institutions do not break out the data by section of campus so we keep the benchmarks at a Total Campus view
- **Database limitations:**
  - Sightlines does not work at a Total Campus level at every campuses
Human Resource Allocation Example

15 Total FTE

6 FTE E&G

3 FTE Housing

6 FTE Athletics
All Comparative Benchmarks are E&G v Peers E&G

Unless otherwise noted on the individual slide

<table>
<thead>
<tr>
<th>Peers</th>
<th>E&amp;G</th>
<th>Housing</th>
<th>Total Campus Energy</th>
<th>Total Campus Grounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clemson University</td>
<td>X</td>
<td>x</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Florida State University</td>
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<td></td>
<td></td>
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<tr>
<td>Georgia Institute of Technology</td>
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<td>X</td>
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<tr>
<td>Rutgers University</td>
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<td>x</td>
<td></td>
</tr>
<tr>
<td>The Ohio State University</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>University of Oregon</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia Commonwealth University</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| SEC                                        |     |         |                      |                      |
| Louisiana State University                 | X   |         |                      |                      |
| Mississippi State University               |     | x       |                      |                      |
| The University of Mississippi              |     | x       |                      |                      |
| University of Arkansas                     | X   |         |                      |                      |
| University of Florida                      | X   |         |                      |                      |
| University of Tennessee                    | X   |         |                      |                      |
| University of Kentucky                     | X   |         |                      |                      |
| University of Missouri                     | X   |         |                      |                      |

| FY 14                                      |     |         |                      |                      |
| University of Georgia                      | X   |         |                      |                      |
| Vanderbilt                                 | Total Campus Only | X |                      |                      |
## Top 100 National Universities* – SL Members


**Recently added member. Data not yet available in distribution graphs.

### Top 100 National Universities – Sightlines Members

<table>
<thead>
<tr>
<th>American University</th>
<th>Purdue University</th>
<th>University of Georgia**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston College</td>
<td>Rice University**</td>
<td>University of Iowa**</td>
</tr>
<tr>
<td>Brandeis University</td>
<td>Rensselaer Polytechnic Institute</td>
<td>University of Illinois – Urbana Champaign</td>
</tr>
<tr>
<td>Brown University</td>
<td>Rutgers University</td>
<td>University of Maryland</td>
</tr>
<tr>
<td>Carnegie Mellon University</td>
<td>Stevens Institute of Technology</td>
<td>University of Massachusetts - Amherst</td>
</tr>
<tr>
<td>Case Western Reserve University</td>
<td>Syracuse University</td>
<td>University of Michigan</td>
</tr>
<tr>
<td>Clemson University</td>
<td>Texas Christian University**</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>Drexel University</td>
<td>The Johns Hopkins University</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>Duke University</td>
<td>The Ohio State University</td>
<td>University of New Hampshire</td>
</tr>
<tr>
<td>Florida State University</td>
<td>The Pennsylvania State University</td>
<td>University of Notre Dame</td>
</tr>
<tr>
<td>Georgia Institute of Technology</td>
<td>The University of Alabama</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>Indiana University</td>
<td>Tufts University</td>
<td>University of Rochester</td>
</tr>
<tr>
<td>Massachusetts Institute of Technology</td>
<td>University of Chicago</td>
<td>University of San Diego</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>University of California Davis</td>
<td>University of Vermont</td>
</tr>
<tr>
<td>New York University</td>
<td>University of California Irvine</td>
<td>Vanderbilt University**</td>
</tr>
<tr>
<td>Northeastern University</td>
<td>University of Colorado – Boulder</td>
<td>Washington University in St. Louis**</td>
</tr>
<tr>
<td>Northwestern University</td>
<td>University of Denver</td>
<td>Worcester Polytechnic Institute**</td>
</tr>
<tr>
<td>Princeton University</td>
<td>University of Florida</td>
<td>Yeshiva University</td>
</tr>
</tbody>
</table>

*Top 100 National Universities* – Sightlines Members
## Benchmarking for Context

<table>
<thead>
<tr>
<th>&quot;Qualifying&quot; Metric</th>
<th>Alabama</th>
<th>Peer Average</th>
<th>Bottom Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density Factor (Total Campus)</td>
<td>307</td>
<td>349</td>
<td>Less Crowded than Peers</td>
</tr>
<tr>
<td>Tech Rating (E&amp;G)</td>
<td>3.59</td>
<td>3.26</td>
<td>More Complex Building Systems</td>
</tr>
<tr>
<td>Building Intensity (E&amp;G)</td>
<td>26</td>
<td>32</td>
<td>Larger Buildings</td>
</tr>
<tr>
<td>Grounds Intensity (Total Campus)</td>
<td>0.18</td>
<td>0.56</td>
<td>More Amounts of Green Space</td>
</tr>
</tbody>
</table>

**Bottom Line**

- Less Crowded than Peers
- More Complex Building Systems
- Larger Buildings
- More Amounts of Green Space
Impacts of Density & Technical Complexity

**Users/100,000 GSF**

**Distribution of Density Factor**

- Alabama
- Peers

**E&G Complexity of Building Systems**

**Distribution of Tech Rating**

- Peers
- Alabama

**Why Density Matters?**
- Capital Renewal (Buildings)
- “Wear and Tear” on Spaces
- Maintenance Operation
- Custodial Operation

**Why Technical Complexity Matters?**
- Energy Consumption
- Operating Costs
- Maintenance Operation
- Capital Renewal

*Top 100 National Universities in database used for curves*
Key Findings – E&G

- **Alabama’s campus is younger than peers.** Almost 70% of Alabama’s E&G space has been fully renovated or newly constructed in the last 25 years. About 16% of E&G space was built in a lower quality construction era and hasn’t had a full scale renovation in the past 25 years.

- **Annual Stewardship investment for E&G space has been 10% less than peers across the eleven year analysis.** However, Asset Reinvestment funds propel total E&G spending above target each of the past seven years. Type of spending into existing E&G space has been evenly distributed between envelope/mechanical and space/programming. In the past eleven years, 57% of E&G total capital dollars have been put into new construction.

- **Alabama’s entire campus consumes less total energy than peers in FY13 at a higher unit cost.** While unit costs have been decreasing consistently over the past 6 years, consumption is rising as more complex gross square footage is added to campus.

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Database: Two Waves of Construction

First wave of buildings are now 50 years old; second wave nears 20 years old

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 Sightlines Database (1880-Present)

- GSF Constructed (5 Year Cohorts)
Building Risk Affected by Construction Vintage

Campus space proportioned throughout all eras, complex being the largest

- **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 E&G Space at Alabama (1820 - 2013)**

- 26%
- 18%
- 19%
- 37%

GSF (Thousands)
Through renovations, UA has decreased it’s E&G construction age by 56% while peers have seen an 19% decrease.
Renovations Have Created a Younger Campus than Peers

E&G Renovation Age by Category

- Under 10: Peer E&G Average - 42%, Alabama E&G - 69%
- 10 to 25: Peer E&G Average - 32%, Alabama E&G - 28%
- 25 to 50: Peer E&G Average - 26%, Alabama E&G - 3%
- Over 50: Peer E&G Average - 0%

% of Campus GSF
**Age Matters**

*Younger E&G space provides opportunities to plan for future*

**Age and Life Cycle Costs**

- Under 10 Years: 17% of Alabama E&G Space
- 10-25 Years
- Over 25 Years

*Life cycle costs based on an average air conditioned classroom building.*
Identifying Most Critical Need Buildings

As defined by construction vintage and renovation age category

E&G GSF by Construction Vintage

- Pre-War: 37%
- Post-War: 26%
- Modern: 18%
- Complex: 19%

E&G GSF by Renovation Age

- Under 10: 42%
- 10 to 25: 27%
- 25 to 50: 28%
- Over 50: 3%

16% of E&G GSF, 42 E&G Buildings, appear in both categories

By total gross square footage:
- Gordon Palmer Hall
- Moody Music Building
- Biology Building
- Ten Hoor Hall
- Martha Parham Hall – west

Over 25 Years 31% of E&G GSF
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E&G Total Spending: Existing + New Space

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Existing Space</th>
<th>New Space</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY03</td>
<td>$40</td>
<td>$20</td>
<td>$30</td>
</tr>
<tr>
<td>FY04</td>
<td>$20</td>
<td>$30</td>
<td>$25</td>
</tr>
<tr>
<td>FY05</td>
<td>$10</td>
<td>$40</td>
<td>$25</td>
</tr>
<tr>
<td>FY06</td>
<td>$20</td>
<td>$20</td>
<td>$20</td>
</tr>
<tr>
<td>FY07</td>
<td>$10</td>
<td>$30</td>
<td>$20</td>
</tr>
<tr>
<td>FY08</td>
<td>$60</td>
<td>$0</td>
<td>$30</td>
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<td>FY09</td>
<td>$100</td>
<td>$20</td>
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</tr>
<tr>
<td>FY10</td>
<td>$80</td>
<td>$40</td>
<td>$60</td>
</tr>
<tr>
<td>FY11</td>
<td>$100</td>
<td>$40</td>
<td>$70</td>
</tr>
<tr>
<td>FY12</td>
<td>$100</td>
<td>$40</td>
<td>$80</td>
</tr>
<tr>
<td>FY13</td>
<td>$100</td>
<td>$40</td>
<td>$90</td>
</tr>
</tbody>
</table>
E&G Existing Space Spending

Millions of Dollars

FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13

Existing Space  Average

$0 $20 $40 $60 $80 $100 $120

FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13
Two Different Investment Eras into Existing E&G Space

$1.67/GSF Less ($10.3M) per Year

$0.94/GSF More ($6.3M) per Year

AR = Asset Reinvestment
AS = Annual Stewardship
Defining E&G Stewardship Investment Targets

$27.2M needed to “keep up” E&G condition

E&G Replacement Value: $1.8B

3% Replacement Value
$54.4

Equilibrium Need
$30.5
$21.9

Target Need
$10.7
$16.5

35% Space/Program
75% Envelope/Mechanical

Depreciation Model
Sightlines Recommendation
Using One-time Funding to Target Change

E&G Annual Investment vs. Targets

- **Annual Stewardship = DM Fund + Planned Maintenance**
- Decreasing Backlog
- Stabilizing Backlog
- Increasing Backlog

**Millions of Dollars**


**Annual Stewardship**
**Target Need**
**Equilibrium Need**
Opportunity to Align Investment Profile with Age

Averaging 21% of E&G target; Peers averaging 30% of E&G target

Total Annual Stewardship

Peer Averages

The University of Alabama (Tuscaloosa) - E&G

Spending $1.7M less per year
Or $18.7M over the past 11 years
Using One-time Funding to Target Change

E&G Annual Investment vs. Targets

- Decreasing Backlog
- Stabilizing Backlog
- Increasing Backlog

Millions of Dollars

- Annual Stewardship
- Asset Reinvestment
- Target Need
- Equilibrium Need
FY13 E&G Asset Reinvestment Backlog

*Total need is from the 2003 ISES study. It has been extrapolated forward based on deferral to target need.
Proportionate Mix of Spending on Existing E&G Space

E&G Total Project Spending by Category

11 Years of Spending

- Building Envelope: 30%
- Building Systems: 17%
- Infrastructure: 22%
- Space Renewal: 6%
- Safety/Code: 6%

$ in Millions

Year 2003-2013

- 2003: $0
- 2004: $20
- 2005: $40
- 2006: $60
- 2007: $80
- 2008: $100
- 2009: $120
- 2010: $140
- 2011: $160
- 2012: $180
- 2013: $200

Legend:
- Building Envelope
- Building Systems
- Infrastructure
- Space Renewal
- Safety/Code
Over Half of E&G Capital Dollars Going Towards New Space

E&G Total Project Spending by Category

- Building Envelope
- Building Systems
- Infrastructure
- Space Renewal
- Safety/Code
- New Space

11 Years of Spending

$ in Millions

- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013

57%
11%
10%
13%
2%
7%
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Focusing on a Regionally Based Peer Group

*Also part of ROPA Peer Group*
Total Campus: Decreasing Unit Costs – Driven by Fossil

Regional Peer Full Campus vs. Alabama Full Campus

*Energy graphs reflect entire UA campus.*
Total Campus: Consistently Consuming Less than Peers

Regional Peer Full Campus vs. Alabama Full Campus

Total Campus Energy Consumption vs. Peers

*Energy graphs reflect entire UA campus.

BTU/GSF


Peers

Alaska

Fossil  Electric

If Alabama had consumed at peer levels in FY13, it would have cost an additional $7.7M in fossil & electric utility expenditures.

*Energy graphs reflect entire UA campus.

Institutions Ordered By: Tech Rating
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Positive Shift Towards More PM in Recent Years

Dedication of Maintenance Labor

% of Hours

- Repairs
- Preventative Maintenance
- Projects

E&G Maintenance: Similar Input, Higher Output

**E&G Staffing vs. Inspection Scores**

- **General Repair Score (1-5)**
- **GSF/FTE**
- **Increasing Technical Complexity**

**FY13 Inspection Scores (1-5 Scale)**

<table>
<thead>
<tr>
<th>Department</th>
<th>Alabama Peers</th>
<th>Top 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>4.2</td>
<td>3.9</td>
</tr>
</tbody>
</table>

**General Repair Inspection Score**

- **Peers**
- **Alabama**

*Top 100 National Universities in database used for curves*
E&G Custodial: Value Decision – More Input, Higher Output

FY13 Inspection Scores (1-5 Scale)

<table>
<thead>
<tr>
<th>Department</th>
<th>Alabama Peers</th>
<th>Top 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Custodial</td>
<td>4.4</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Cleanliness Inspection Score

*Top 100 National Universities in database used for curves
Grounds: Value Decision - High Input, High Output

**FY13 Inspection Scores (1-5 Scale)**

<table>
<thead>
<tr>
<th>Department</th>
<th>Alabama Peers</th>
<th>Top 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grounds</td>
<td>4.3</td>
<td>4.1</td>
</tr>
</tbody>
</table>

*Top 100 National Universities in database used for curves
**Grounds Inspection score is a measure of grounds maintenance/upkeep, not beautification.

**Grounds Staffing vs. Inspection Scores**

- **Increasing Grounds Intensity**: Institutions Ordered By: Grounds Intensity
Curb Appeal Continuing To Give A Top Notch First Impression

*Top 100 National Universities in database used for curves*
Executive Takeaways
Executive Takeaways

The University of Alabama’s FY13 ROPA Radar Chart

- New construction and renovations have not only shifted campus to a younger age profile over the past few years, but have also increased the technical complexity creating additional capital and operational demands.

- An increased focus on stewardship spending should be a goal as highly complex new space comes online, as one-time capital has mainly supported new construction.

- Energy consumption on campus increased in FY13, but remains below peers. Any cost avoidance should be reallocated towards Annual Stewardship and preventative/planned maintenance.

- Operations output is strong with similar staffing levels outperforming peers in each functional area. Facilities should monitor these staffing allocations as more space is continually bought, constructed and renovated to higher standards than historically.
Longitudinal Look

Improvements across all 4 axes from FY2003