FY2013 ROPA Presentation
The University of Alabama – Education & General (E&G)

Kevan Will, Tom Gugert & James Ireland
A Vocabulary for Measurement

The Return on Physical Assets – ROPA \(^{SM}\)

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

The accumulated backlog of repair / modernization needs and the definition of resource capacity to correct them “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

Comparative Considerations
Size, technical complexity, region, geographic location, and setting are all factors included in the selection of peer institutions

Academic
- 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

SEC
- 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
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>
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<td>Total Campus Only</td>
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# Top 100 National Universities* – SL Members

## Top 100 National Universities – Sightlines Members

<table>
<thead>
<tr>
<th>American University</th>
<th>Purdue University</th>
<th>University of Georgia**</th>
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<tbody>
<tr>
<td>Boston College</td>
<td>Rice University**</td>
<td>University of Iowa**</td>
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<td>Brandeis University</td>
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<td>University of Illinois – Urbana Champaign</td>
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<td>Brown University</td>
<td>Rutgers University</td>
<td>University of Maryland</td>
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<td>Carnegie Mellon University</td>
<td>Stevens Institute of Technology</td>
<td>University of Massachusetts - Amherst</td>
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<td>Case Western Reserve University</td>
<td>Syracuse University</td>
<td>University of Michigan</td>
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<td>Clemson University</td>
<td>Texas Christian University**</td>
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<td>Drexel University</td>
<td>The Johns Hopkins University</td>
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<td>University of Vermont</td>
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<td>Vanderbilt University**</td>
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<td>Northeastern University</td>
<td>University of Colorado – Boulder</td>
<td>Washington University in St. Louis**</td>
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<tr>
<td>Princeton University</td>
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<td>Yeshiva University</td>
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**Recently added member. Data not yet available in distribution graphs.
## Benchmarking for Context

<table>
<thead>
<tr>
<th>“Qualifying” 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>
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</tbody>
</table>
Impacts of Density & Technical Complexity

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

*Top 100 National Universities in database used for curves

**Why Technical Complexity Matters?**
- Energy Consumption
- Operating Costs
- Maintenance Operation
- Capital Renewal
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
Building Risk Affected by Construction Vintage

Campus space proportioned throughout all eras, complex being the largest

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Campus space proportioned throughout all eras, complex being the largest:

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

GSF Constructed (10 Year Cohorts)
Through renovations, UA has decreased its 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

<table>
<thead>
<tr>
<th>% of Campus GSF</th>
<th>Peer E&amp;G Average</th>
<th>Alabama E&amp;G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10</td>
<td>Navy Blue</td>
<td>Navy Blue</td>
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<tr>
<td>10 to 25</td>
<td>Maroon</td>
<td>Maroon</td>
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<tr>
<td>25 to 50</td>
<td>Light Green</td>
<td>Light Green</td>
</tr>
<tr>
<td>Over 50</td>
<td>Dark Green</td>
<td>Dark Green</td>
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</table>

- Peer E&G Average:
  - Under 10: 42%
  - 10 to 25: 32%
  - 25 to 50: 26%
  - Over 50: 3%

- Alabama E&G:
  - Under 10: 69%
  - 10 to 25: 28%
  - 25 to 50: 3%
  - Over 50: 3%
Age Matters

Younger E&G space provides opportunities to plan for future

Age and Life Cycle Costs

*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: 18%
- 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
Key Findings – E&G

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E&G Total Spending: Existing + New Space

Millions of Dollars

FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13

Existing Space New Space Average

$0 $10 $20 $30 $40 $50 $60 $70 $80 $90 $100 $110 $120

$20

20
E&G Existing Space Spending

- FY03: $10
- FY04: $20
- FY05: $20
- FY06: $30
- FY07: $40
- FY08: $60
- FY09: $40
- FY10: $40
- FY11: $40
- FY12: $40
- FY13: $60

Millions of Dollars

Exisiting Space and Average Spent Over Fiscal Years 2003 to 2013.
Two Different Investment Eras into Existing E&G Space

Total Project Spending by AS & AR

$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
  - Envelope/Mechanical: $21.9
  - Space/Program: $9.6
- Target Need: $10.7
  - Envelope/Mechanical: $16.5
  - Space/Program: $4.2

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

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

- **Millions of Dollars**


- **Graphs:**
  - Decreasing Backlog
  - Stabilizing Backlog
  - Increasing Backlog

- **Color Codes:**
  - **Annual Stewardship**
  - **Asset Reinvestment**
  - **Target Need**
  - **Equilibrium Need**

- **Legend:**
  - **Annual Stewardship**
  - **Asset Reinvestment**
  - **Target Need**
  - **Equilibrium Need**
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

$ in Millions

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

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

Building Envelope  Building Systems  Infrastructure  Space Renewal  Safety/Code

Over Half of E&G Capital Dollars Going Towards New Space

11 Years of Spending

E&G Total Project Spending by Category

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

$ in Millions

Key Findings – E&G

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Focusing on a Regionally Based Peer Group

*Also part of ROPA Peer Group

**Regional/Climate Zone Peers**

- Clemson University*
- Duke University
- Florida State University*
- Georgia Institute of Technology*
- Louisiana State University*
- Mississippi State University*
- The University of Alabama*
- The University of Mississippi*
- University of Florida*

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*Climate Zones*

- Zone 1 is less than 2,000 CDD and greater than 7,000 HDD.
- Zone 2 is less than 2,000 CDD and 5,500-7,000 HDD.
- Zone 3 is less than 2,000 CDD and 4,000-5,499 HDD.
- Zone 4 is less than 2,000 CDD and less than 4,000 HDD.
- Zone 5 is 2,000 CDD or more and less than 4,000 HDD.
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.*
Total Campus: Lowest FY13 Consumption within Peer Group

Regional Peer Full Campus vs. Alabama Full Campus

FY13 Energy Consumption vs. Peers

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.
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Positive Shift Towards More PM in Recent Years

Dedication of Maintenance Labor

% of Hours

- Repairs
- Preventative Maintenance
- Projects

Years: 2003 to 2013
E&G Maintenance: Similar Input, Higher Output

E&G Staffing vs. Inspection Scores

FY13 Inspection Scores (1-5 Scale)

<table>
<thead>
<tr>
<th>Department</th>
<th>Alabama Peers</th>
<th>Top 100</th>
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<td></td>
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General Repair Inspection Score

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

FY13 Inspection Scores (1-5 Scale)

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

*Top 100 National Universities in database used for curves

**Grounds Inspection score is a measure of grounds maintenance/upkeep, not beautification.

Institutions Ordered By: Grounds Intensity

**Grounds Staffing vs. Inspection Scores**

*Increasing Grounds Intensity*
Curb Appeal Continuing To Give A Top Notch First Impression

Curb Appeal
(Grounds Score + Exterior Score)

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