Sightlines

Facilities MB&A Presentation

Millersville University of Pennsylvania

Presented by: Matt Bausher and Lindsay Solar

February 14, 2011
A Vocabulary for Measurement
The Return on Physical Assets – ROPA\textsuperscript{SM}

- **Annual Stewardship**: The annual investment needed to insure buildings will properly perform and reach their useful life \textit{"Keep-Up Costs"}

- **Asset Reinvestment**: The accumulated backlog of repair and modernization needs and the definition of resource capacity to correct them. \textit{"Catch-Up Costs"}

- **Operating Effectiveness**: The effectiveness of the facilities operating budget, staffing, supervision, and energy management

- **Service**: The measure of service process, the maintenance quality of space and systems, and the customers opinion of service delivery

**Peers:**
PASSHE
Pennsylvania State System of Higher Education

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Millersville University
Physical Characteristics in Context

Millersville has the third highest tech rating in PASSHE

Tech Rating

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Institutions Ordered By: Tech Rating

Tech Rating Impacts
- More complex building systems generally cost more to maintain and repair.
- Maintenance staff and supervisors need increased training
- Maintenance material spending increases
Core Observations for Millersville University

Strengths:

1. Space Profile
   - Achieving a balanced age profile by resetting building lifecycles through renovation.

2. Capital Investments
   - Strong balance of spending.

3. Operations Highlights
   - Increased grounds efficiency with increased inspection scoring.

4. Emissions Profile
   - Decreased energy consumption offset the increase in electric unit costs, and decreased the emissions profile. Campus emits below average carbon levels to educate one student.

Challenges and Opportunities:

- Increasing density creates more wear and tear on facilities. High building intensity means smaller buildings that cost more to maintain.

- The loss of Key 93 creates the pressing need for a new source of recurring capital.

- An opportunity exists for higher efficiency of the maintenance and custodial departments, including the need for a more robust planned maintenance program.

- Decrease reliance on electric consumption to allow for a decrease in overall utility spending and lower emissions.
# Core Observations for Millersville University

## Strengths:

<table>
<thead>
<tr>
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<th>Achieving a balanced age profile by resetting building lifecycles through renovation.</th>
</tr>
</thead>
<tbody>
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</tr>
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## Challenges and Opportunities:

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| 3. | An opportunity exists for higher efficiency of the maintenance and custodial departments, including the need for a more robust planned maintenance program. |
| 4. | Decrease reliance on electric consumption to allow for a decrease in overall utility spending and lower emissions. |
Space Profile – Age of Campus

Renovations reset building lifecycles, creating a balanced age profile

**Campus Age**

- **Younger**
  - 0-10
  - 10-25
  - 25-50
- **Older**
  - 50+

**GSF**

- 0%
- 10%
- 20%
- 30%
- 40%
- 50%
- 60%
- 70%

**Construction Age** vs. **Renovation Age**

**Space Profile:**
- 95 buildings
- 1,978,502 gross square feet
- 200 acres

**Weighted Construction Age:** 49.8 years

**Weighted Renovation Age:** 33.9 years
Space Profile – Age of Campus

Renovations reset building lifecycles, creating a balanced age profile

Campus Age

<table>
<thead>
<tr>
<th>GSFL</th>
<th>Younger</th>
<th>Older</th>
</tr>
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<tbody>
<tr>
<td>70%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td></td>
<td></td>
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<tr>
<td>30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Construction vs. Renovation Age - % Under 10

Peer Averages
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Millersville University of Pennsylvania

Space Profile:
95 buildings
1,978,502 gross square feet
200 acres

Weighted Construction Age: 49.8 years
Weighted Renovation Age: 33.9 years
Space Profile – Age of Campus
Age profile in context with peers

Campus Renovation Age Profile vs. Peers

- Over 50 Years
- 25 to 50 Years
- 10 to 25 Years
- Under 10 Years

% of GSF

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Millersville Peer Average

44% 41%
Space Profile – Many Small Buildings

Building Intensity is the highest in the peer group

**Building Intensity**

FY10 Peer Average:
31 buildings to make 1 M GSF

FY10 Millersville:
45 buildings to make 1 M GSF

**Frequency of Occurrence in Database**

-1 st.dev.  +1 st.dev.

Millersville University

SEIZE THE OPPORTUNITY
User Density of Campus

Millersville's density has increased since 2003 unlike PASSHE peers

Density Factor

<table>
<thead>
<tr>
<th>Year</th>
<th>Peer Average</th>
<th>Millersville</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>389</td>
<td>404</td>
</tr>
<tr>
<td>2004</td>
<td>389</td>
<td>404</td>
</tr>
<tr>
<td>2005</td>
<td>389</td>
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<td>2006</td>
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<td>404</td>
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<tr>
<td>2007</td>
<td>389</td>
<td>404</td>
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<tr>
<td>2008</td>
<td>389</td>
<td>404</td>
</tr>
<tr>
<td>2009</td>
<td>389</td>
<td>404</td>
</tr>
<tr>
<td>2010</td>
<td>389</td>
<td>404</td>
</tr>
</tbody>
</table>

- Peer average = 389
- Your average = 404
Projected User Density of Campus
Future impact on density assuming constant population or population growth

Change Users and Space since FY2003

% Change since FY2003

-2%  3%  8%  13%  18%

2003  2004  2005  2006  2007  2008  2009  2010

- Peer Users
- Peer GSF
- Millersville Users
- Millersville GSF
Projected User Density of Campus

Future impact on density assuming constant population and growing population.
Core Observations for Millersville University

Strengths:

1. Space Profile
   Achieving a balanced age profile by resetting building lifecycles through renovation.

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   Strong balance of spending.

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   Increased grounds efficiency with increased inspection scoring.

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   Decreased energy consumption offset the increase in electric unit costs, and decreased the emissions profile. Campus emits below average carbon levels to educate one student.

Challenges and Opportunities:

Increasing density creates more wear and tear on facilities. High building intensity means smaller buildings that cost more to maintain.

The loss of Key 93 creates the pressing need for a new source of recurring capital.

An opportunity exists for higher efficiency of the maintenance and custodial departments, including the need for a more robust planned maintenance program.

Decrease reliance on electric consumption to allow for a decrease in overall utility spending and lower emissions.
Capital Investment – by Funding Source

Millersville’s drop in capital investment contrasts increased spending by peers

Total Project Spending

- Peer Average
- Millersville

$/GSF

FY03  FY04  FY05  FY06  FY07  FY08  FY09  FY10  FY03  FY04  FY05  FY06  FY07  FY08  FY09  FY10

- Annual Stewardship
- Asset Reinvestment

Peers’ Longitudinal Average: $4.04/GSF
Millersville’s Longitudinal Average: $6.13/GSF
Capital Investment – by Funding Source

Millersville's drop in capital investment contrasts increased spending by peers

Total Project Spending

Peer Average

Millersville

$/GSF

$12

$10

$8

$6

$4

$2

$-

FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY03 FY04 FY05 FY06 FY07 FY08 FY09 FY10

Annual Stewardship

Peers' Stewardship Average: $0.72/GSF

Millersville's Stewardship Average: $0.76/GSF
Setting a Stewardship Investment Target
Defining attainable goals to manage the rate of deferral

**Millersville FY2010 Targets**

Replacement Value of $615 million

- **3% of Replacement Value**
  - $18.5

- **Life Cycle**
  - $7.1
  - $9.4

- **Functional Obsolescence**
  - $3.3
  - $5.3

Equilibrium Need: $16.5 Million
Target Need: $8.6 Million

**Sightlines Recommendations**

- Total Need
- Envelope/Mech
- Space/Program
Recurring Capital Drastically Falls Short of Target

Increase in deferral because of increasing need and decreasing investment

- Expansion of Student memorial Center
- New Visual and Performing Arts Center

**Millersville Mix of Spending**
- 17% Repairs
- 83% Capital

**Peer Mix of Spending**
- 19% Repairs
- 81% Capital

<table>
<thead>
<tr>
<th>Year</th>
<th>$ in Millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>$4.6 M</td>
</tr>
<tr>
<td>2004</td>
<td>$4.5 M</td>
</tr>
<tr>
<td>2005</td>
<td>$4.3 M</td>
</tr>
<tr>
<td>2006</td>
<td>$4.0 M</td>
</tr>
<tr>
<td>2007</td>
<td>$5.2 M</td>
</tr>
<tr>
<td>2008</td>
<td>$6.0 M</td>
</tr>
<tr>
<td>2009</td>
<td>$7.0 M</td>
</tr>
<tr>
<td>2010</td>
<td>$8.1 M</td>
</tr>
</tbody>
</table>

**Legend:**
- Envelope & Mechanical
- Space & Program
- Investment Target

Millersville University
SEIZE THE OPPORTUNITY
FY10: $5.2M E&G Need, $3.3M Auxiliary Need

E&G Need Represents about 60% of Total

- New Visual and Performing Arts Center
- Expansion of Student memorial Center

$ in Millions


Investment Target  E&G Target Need  Auxiliary Target Need
Capital Investment – by Funding Source

Drop in stewardship across system; however, Millersville has less PM

Annual Stewardship by Source

<table>
<thead>
<tr>
<th>% of Target</th>
<th>Planned Maintenance</th>
<th>Recurring Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY04</td>
<td></td>
<td></td>
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<tr>
<td>FY05</td>
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<tr>
<td>FY09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FY10</td>
<td></td>
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</table>

**Peers' Longitudinal Average**
- Planned Maintenance: 6% of target
- Recurring Capital: 16% of target

**Millersville Longitudinal Average**
- Planned Maintenance: 2% of target
- Recurring Capital: 20% of target
Total Capital Investment Over Time

One time capital infusions used historically to “catch up” to target drop off

$25

$20

$15

$10

$5

$-

2003 2004 2005 2006 2007 2008 2009 2010

Increasing Net Asset Value

Sustaining Net Asset Value

Decreasing Net Asset Value

$ in Millions

Annual Stewardship  Asset Reinvestment

Millersville University
Total Project Spending by Type

Similar investment mix with PASSHE, database spends more heavily in space

Millersville University

8-year Investment
$6.14/GSF

PASSHE Average

8-year Investment
$4.04/GSF

Public Database Average

8-year Investment
$4.06/GSF

- Bldg. Envelope
- Infrastructure
- Code
- Bldg. Systems
- Space
## Core Observations for Millersville University

### Strengths:

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### Challenges and Opportunities:

- **Challenges**
  - Increasing density creates more wear and tear on facilities.
  - High building intensity means smaller buildings that cost more to maintain.
  - The loss of Key 93 creates the pressing need for a new source of recurring capital.
  - An opportunity exists for higher efficiency of the maintenance and custodial departments, including the need for a more robust planned maintenance program.

- **Opportunities**
  - Decrease reliance on electric consumption to allow for a decrease in overall utility spending and lower emissions.
Facilities Operating Budget

Millersville has higher operating costs than peers

Facilities Operating Budget Total

Total Planned Maintenance

Daily Service Budget

Benchmarks ordered by Tech Rating
Planned Maintenance
A major area of opportunity

Total Planned Maintenance

Peer Averages
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Millersville University of Pennsylvania

$158,110 each year

Benchmark ordered by Tech Rating
Maintenance Performance

More staff covering space, with lower output

Maintenance Staffing

Maintenance Materials

Benchmarks ordered by Tech Rating

Maintenance Coverage

General Repair Scores

FY10 PASSHE

FY10 Millersville

-1 SD          +1 SD

Millersville University
Custodial Performance

More staff covering space, with excellent output

Custodial Staffing

Benchmarks ordered by Density

Custodial Materials

Custodial Coverage

FY10 PASSHE

FY10 Millersville

Cleanliness Scores

FY10 PASSHE

FY10 Millersville

Millersville University

SEIZE THE OPPORTUNITY
Grounds Performance

Staffing level in line with grounds profile with high inspection scores

**Grounds Staffing**

![Grounds Staffing Graph]

**Grounds Materials**

![Grounds Materials Graph]

**Correlation: Grounds Intensity & Grounds Coverage**

![Correlation Graph]

**Grounds Scores**

![Grounds Scores Graph]
Service – Campus Inspection

Overall, Millersville's campus shows well

The Service Relationship

Campus Inspection

Customer Satisfaction

Service Process

Campus Inspection Index

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Institutions Ordered By: Density Factor

Millersville University

121 THE OPPORTUNITY
Service Process – Communication with Campus

Implementation of work order system has potential for improvement

The Service Relationship

Campus Inspection

Customer Satisfaction

Service Process

Service Process Index

Institutions Ordered By: Density Factor

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Millersville University
SEE THE OPPORTUNITY
Service Process – Communication with Campus

Implementation of work order system has potential for improvement

- Centralization
- Scheduling Process
- Organization
- Work Request System
- Performance Measurement

Service Process Index

Institutions Ordered By: Density Factor

- Install a functioning system
- Streamline your work-order process
- Make sure the system provides more than data
- Clearly define who does what
- Track and report frequently for reliable data
Service – Customer Satisfaction

Customer’s satisfaction with campus – in need of updating this year

The Service Relationship

Campus Inspection

Customer Satisfaction

Service Process

My General Satisfaction with Facilities Management FY08:

- Below Expectations: 5%
- Meets Expectations: 12%
- Exceeds Expectations: 36%
- Far Exceeds Expectations: 47%

88% of FY08 respondents feel Facilities Services meets or exceeds expectations.

Millersville University
Core Observations for Millersville University

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Energy Cost and Consumption

Reduction in consumption; however, increased unit cost
Utility Budget Analysis

Decrease in consumption offsets the increase in electric cost

**Consumption By Type**

- MMBTU
  - 2008: 160,000
  - 2009: 160,000
  - 2010: 160,000

- Fossil
- Electric

**Unit Cost**

- $/MMBTU
  - 2008: $15
  - 2009: $15
  - 2010: $15

- Fossil
- Electric

**Total Spending By Type**

- $:
  - 2008: $2,500,000
  - 2009: $3,000,000
  - 2010: $3,500,000

- Fossil
- Electric
- Total

Decreased consumption allowed for savings of $257,911
Consumption Impacts Carbon Emissions

Reduction in energy consumption caused emissions to decrease by 7%
FY10 Carbon Emissions: 36,318 MTCDE

Electricity consumption is responsible for 60% of emissions

Carbon Emissions by Type

- Electricity: 60%
- Commute: 22%
- T&D Losses: 6%
- On-Campus Stationary: 4%
- Refrigerants: 2%
- Agriculture: 0%
- Air Travel: 3%
- Study Abroad: 2%
- Paper: 0%
- Wastewater: 0%
- Vehicle Fleet: 1%

Carbon Emissions by Scope

- Scope 1 Emissions
- Scope 2 Emissions
- Scope 3 Emissions

- FY2009
- FY2010
Go-Green Peer Group

Millersville has higher emissions than peer average due to electric-dominated profile.

Gross Emissions (per 1,000 GSF)

- Scope 3 / 1,000 GSF
- Scope 2 / 1,000 GSF
- Scope 1 / 1,000 GSF

Institutions Ordered By: Total BTU/GSF

Go-Green Peer Institutions
- Babson College
- Bentley College
- Fitchburg State University
- Loyola University Maryland
- Rowan University
- Shippensburg University
- Slippery Rock University
- The University of Dayton
Emissions By Scope

High commuting on Millersville Campus adds to Scope 3

Emissions Profile

Millersville

- 60% (Green)
- 33% (Gray)
- 7% (Blue)

Peer Average

- 45% (Green)
- 28% (Gray)
- 27% (Blue)
Scope 1 Summary
Lowest scope 1 emissions a result of minimal fossil fuel consumption

Scope 1 Emissions (per 1,000 GSF)

Fossil Fuel Consumption

Stationary Emissions (per 1,000 GSF)

Refrigerant MTCDE / 1,000 GSF
Agriculture MTCDE / 1,000 GSF
Fleet MTCDE / 1,000 GSF
On-Campus Stationary MTCDE / 1,000 GSF

Average 4.5119

Institutions Ordered By: Total BTU/GSF
Drop in Electricity Consumption in FY2010
Remains highest consumer of electric among peers
Scope 2 is Main Component of Profile

Electric reduction on Millersville's campus in FY10 greater than peer reduction

Scope 2 Emissions (per 1,000 GSF)

Peer Averages
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Millersville University of Pennsylvania

MTCDE / 1,000 GSF

2005 2006 2007 2008 2009 2010

2005 2006 2007 2008 2009 2010
Mitigating Electricity
Analyzing the impact of using electric heat

Carbon Intensity of Fuels:
Emissions per each unit of Energy

<table>
<thead>
<tr>
<th>Fuel</th>
<th>MTCDE/ MMBTU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>0.08</td>
</tr>
<tr>
<td>Residual Oil</td>
<td>0.06</td>
</tr>
<tr>
<td>Distillate Oil</td>
<td>0.04</td>
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<tr>
<td>Propane</td>
<td>0.02</td>
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<tr>
<td>Natural Gas</td>
<td>0.00</td>
</tr>
<tr>
<td>Electric</td>
<td>0.20</td>
</tr>
</tbody>
</table>
Two different perspectives for benchmarking

GHG Emissions per 1,000 SF

Stresses efficient operation of physical plant.

\[
\frac{\text{Net GHG Emissions}}{\text{Total GSF in Footprint}} \times 1000
\]

GHG Emissions per Student

Stresses efficient use of space.

\[
\frac{\text{Net GHG Emissions}}{\text{Total Student FTE}}
\]
Scope 3 Summary

Significant FY10 drop in air travel places Millersville at peer average

Scope 3 Emissions (per Student)

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Institutions Ordered By: Density Factor
Millersville falls below the database average for emissions per student.
Concluding Considerations
Concluding Comments

Facilities MB&A

Space profile key observations:
- Large renovation projects have reset building lifecycles and created a more balanced age profile
- High building intensity increases the operating costs
- Increasing density of campus increases the wear and tear of buildings.

Similar to PASSHE peers, Millersville feels pressures to develop new sources of stewardship funding, due to loss of Key 93. In FY10, there was also a decrease of total project spending, creating a shortfall from target investment. Millersville must identify building portfolios, develop targets and define a capital phase out plan to strategically align the investment capacity with the needs. Additionally, increased focus on stewardship dollars will help decrease the reinvestment spending need.

Operationally, Millersville has an opportunity to increase the efficiency of the maintenance and custodial staff. Increasing the planned maintenance program is a impactful strategy moving forward for the maintenance department. The grounds staff operates efficiently with a higher than average grounds intensity and this should be continued.

Millersville cut energy consumption in FY2010, which helped offset the increase in the unit cost of electric. Continuing to cut consumption and reduce reliance on electricity can help with monetary and carbon avoidance in future years.
Longitudinal ROPA Performance

Focusing resources in stewardship (capital & PM) will positively affect other areas

FY2003 ROPA Radar Chart

FY2007 ROPA Radar Chart

FY2010 ROPA Radar Chart

Annual Stewardship

Asset Reinvestment

Operating Effectiveness

Service

Optimal  Target  Actual
Questions and Discussion