A PRESENTATION FOR

NC HEA Spring 2009 Conference

Benchmarking Facilities Management Issues

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What is benchmarking?

- Measurement of the quality of your policies, products, programs, strategies, etc., and comparing them with standard measurements, or similar measurements of best-in-class organizations.

- The objectives of this exercise are (1) to determine what and where improvements are called for, (2) how others achieve their high performance levels, and (3) use this information to improve your performance.

- Source: www.businessdictionary.com
What is benchmarking?

• “… the process of measuring an organization's internal processes then identifying, understanding, and adapting outstanding practices from other organizations considered to be best-in-class.” [www.benchnet.com]
• “… the process of comparing the cost, time or quality of what one organization does against what another organization does. The result is often a business case for making changes in order to make improvements.

  Also referred to as "best practice benchmarking" or "process benchmarking", it is a process used in management and particularly strategic management, in which organizations evaluate various aspects of their processes in relation to best practice, usually within their own sector. This then allows organizations to develop plans on how to make improvements or adopt best practice, usually with the aim of increasing some aspect of performance. Benchmarking may be a one-off event, but is often treated as a continuous process in which organizations continually seek to challenge their practices.” [www.wikipedia.com]
FM Benchmarking

• Over 90% of facilities' typical annual operating expenses focus on four areas:
  ○ Utilities
  ○ Maintenance
  ○ Custodial
  ○ Security
  ○ Space utilization

• Source: 
  www.FMbenchmarking.com
The benchmarking cycle

The overall benchmarking cycle is a continuous improvement process... a circle that repeats annually and allows all of the participants to gain from the experiences of others.

1. Define Parameters & Reach Consensus
2. Benchmark Partners
3. Gather Data
4. Publish Comparisons
5. Focus on Those That Appear Better
6. Implement Ideas
7. Track
8. Repeat

Source: FACILITIES MANAGEMENT RESOURCES BENCHMARKING, www.FMLink.com
Metrics

• Denominator makes a difference
  • Gross SF, Rentable SF, Net Usable SF
  • What about garages and grounds?

• Relate to operational efficiencies
  ○ Occupants per sq. ft.
  ○ Maintenance cost (or FTE) per sq. ft.
  ○ Maintenance cost (or FTE) per bed
  ○ Maintenance cost (or FTE) per admission
  ○ Maintenance cost (or FTE) per patient day
  ○ How does clinical benchmark itself?
Metrics for windows & skylights

• **U-factor**: heat loss from a window
  ○ Usually 0.2-1.2, < 0.35 in colder climates

• **SHGC**: Solar Heat Gain Coefficient
  ○ How well product limits radiant heat gain caused by sunlight
  ○ 0 – 1, % of heat gain that makes it through

• **Visible transmittance**: how much light comes through; 0 – 1, % of light that makes it through

• **CR**: Condensation Resistance; 0-100
Metrics for walls and roofing systems

- Reflectivity (albedo): roof’s ability to reflect visible, IR and UV wavelengths: 0 – 1
  - ENERGY STAR: Low slope roof < 0.65; Steep slope roof < 0.25
- Emissivity: ability to release absorbed heat: 0 – 1
- R-value: thermal flow resistance of insulation
  - Depends on type of material, thickness, density
- Thermal inertia, thermal mass
- DOE cool roof calculator: Oak Ridge National Laboratory www.ornl.gov
Benchmarking value

- Don’t just see how your data compare with others
- Understand the best practices that other organizations have implemented to achieve lower costs
- Sustainability benchmarking
  - Compliance with LEED-EB
  - Sustainability best practices
<table>
<thead>
<tr>
<th>Maintenance Best Practices</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPM1 Facility condition index survey of your building has been completed and regularly updated to support repair/replace decisions and requests for capital renewal funding.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>BPM2 Contractor selection process assures that work is performed per standards.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>BPM3 Electronic handheld devices have been implemented for maintenance crews to reduce lost work orders, minimize paperwork, and improve productivity.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>BPM4 Equipment standards for replacement components and new design are developed and followed to minimize spare parts storage and reduce training requirements.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>BPM5 JIT (Just-in-Time) material procurement has been implemented for PM work that maximizes worker productivity.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Resource: [www.FMbenchmarking.com](http://www.FMbenchmarking.com)
### Benchmarking custodial best practices

<table>
<thead>
<tr>
<th>BPC12</th>
<th>Inspections are conducted with key stakeholders and a neutral third party on a regular basis (quarterly or semi-annually are the usual frequencies):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>BPC13</td>
<td>Internal staff are assigned to manage custodial contracts:</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>BPC14</td>
<td>National procurement contracts are utilized to leverage purchasing power:</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>BPC15</td>
<td>Out-of-scope work (major moves, area reconfigurations, new construction, special events) is tracked and charged separately from the custodial budget:</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>BPC16</td>
<td>Recycling produces an offsetting cost benefit:</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>BPC17</td>
<td>Recycling programs are run at a cost and materials may not be well sorted by the users:</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

Resource: [www.FMbenchmarking.com](http://www.FMbenchmarking.com)
## Benchmarking LEED best practices

<table>
<thead>
<tr>
<th>LEED / ENERGY CONSERVATION INITIATIVES</th>
<th>Your Building</th>
<th>Percent Responding YES Based on Total Cost/Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>LU01 Motion sensors in conference rooms</td>
<td>yes</td>
<td>91%</td>
</tr>
<tr>
<td>LU02 Motion sensors in general office space</td>
<td>yes</td>
<td>80%</td>
</tr>
<tr>
<td>LU03 Motion sensors in restrooms / washrooms</td>
<td>no</td>
<td>86%</td>
</tr>
<tr>
<td>LU04 Ongoing re-commissioning</td>
<td>no</td>
<td>80%</td>
</tr>
<tr>
<td>LU05 Implement ongoing re-commissioning recommendations</td>
<td>yes</td>
<td>91%</td>
</tr>
<tr>
<td>LU06 Plate and frame heat exchangers to reduce chiller operation when weather permits</td>
<td>yes</td>
<td>80%</td>
</tr>
</tbody>
</table>

Resource: [www.FMbenchmarking.com](http://www.FMbenchmarking.com)
Staffing considerations

- What are your core functions?
- Prioritize functions with administration
- Does staffing match your core functions?
- Labor Cost / GSF
  - Include H&V, benefits, etc.
- Non Labor Cost / GSF
  - Include contracted service labor, parts, supplies, and material
- Quality benchmarks: TJC LS/EC/EM scores on 2 surveys
## Investing in HVAC system maintenance

### Rules of thumb from BOM

Source: “Selling the CEO on HVAC Upgrades” BOM 1/2009.
www.facilitiesnet.com/bom/graphics/bo0109a.pdf

### Typical useful lives and maintenance recommendations for major HVAC plant equipment, based on DOE analyses, manufacturer recommendations, and common practice

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Lifetime (hours)</th>
<th>Major overhaul (% of first cost, interval)</th>
<th>Minor overhaul (% of first cost, interval)</th>
<th>Annual maint. (hours / yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiler</td>
<td>220,000</td>
<td>10% 50,000 hrs</td>
<td>4% 10,000 hrs</td>
<td>8-12</td>
</tr>
<tr>
<td>Chiller</td>
<td>100,000</td>
<td>10% 50,000 hrs</td>
<td>5% 20,000 hrs</td>
<td>25-40</td>
</tr>
<tr>
<td>Cooling tower</td>
<td>100,000</td>
<td>25% 50,000 hrs</td>
<td>10% 5,000 hrs</td>
<td>40-80</td>
</tr>
<tr>
<td>Air handler</td>
<td>100,000</td>
<td>Varies widely</td>
<td>Varies widely</td>
<td>4-8</td>
</tr>
</tbody>
</table>
Benefits of benchmarking

- Reduce costs
- Help earn a 'green' designation, such as LEED-EB, ENERGY STAR, etc.
- Identify best practices.
- Add value to your facilities.
- Support business case for change.
- Identify strengths and weaknesses.
- Justify costs and practices.
- Justify energy efficiency improvements.
- Conduct trend analysis.
Custodial costs: Internal / Contractual

- Janitorial
- Window cleaning
- Supplies and materials
- Costs charged to other departments
- Administration
- Tools
- Other
Custodial issues

• Cleanable area
  ○ Gross area less walls (98.5% for example)
  ○ Less non-cleanable areas: M/E rooms, etc.

• Frequency of cleaning for each type
  ○ Low dusting; high dusting
  ○ Trash removal
  ○ Recycling removal
  ○ Vacuuming
Sample benchmarking chart – CAUTION: organizations unknown

Resource: www.FMbenchmarking.com
Security

- Look at all costs: Internal, contracted
- Perimeter security
- Visitors
- FTE’s
- Staffed entry points
- Card/badge readers; controlled access points
- Annual visitor count
Security best practices

- All employees wear ID badges
- Certification by state, ASIS, others
- Internal audit reviews conducted annually
- Plans reviewed annually for changed regs
Benchmarking Categories: Maintenance

- Organizational culture
- Craft skills development
- Administration, HR
- Supervision, leadership
- Budget & Cost control
- Maintenance processes
- Repair planning / scheduling
- Shutdowns, overhauls
- Planning, prop. mgmt.
- FCA results
- QC: callbacks, feedback
- Facilities, equipment, tools
- Bldg Mgt/Ctrl Sys utilization
- Storeroom measures
- Customer service
- PM, lubrication
- PdM (Predictive)
- CMMS utilization
- Control of C/R processes
- Energy Mgmt
- Safety & security
- Grounds; housekeeping
- Regulatory compliance
- Performance Measurement
- Facilities engineering
Process benchmarking

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The Maintenance Excellence Institute: Worldwide Services – Measured Shop Level Results

Source: www.pride-in-maintenance.com
CMMS Benchmarking Categories

- CMMS Data Integrity [data complete and accurate]
- CMMS Education and Training
- Work Control
- Budget and Cost Control
- Planning and Scheduling
- MRO Materials Management
- Preventive and Predictive Maintenance
- Maintenance Performance Measurement
- Other Uses of CMMS

Source: www.pride-in-maintenance.com
Maintenance performance measures
For all definitions: www.pride-in-maintenance.com

- Actual cost per WO
- % major WO’s completed within 5% of estimate
- % overall maintenance budget compliance
- % overall PM completion [or just critical PM’s…]
- % planned work [planning process effectiveness]
- % planned WO’s from PM/PdM [avoiding failures]
- % craft time for customer charge back
- % WO’s with reliable planned time [planner score]
- % Critical equipment availability
- % Wrench time ( % Craft utilization)
- % Craft performance
- % Inventory accuracy; $ value of inventory reductions; also
  # of stock outs of inventoried stock items
One approach to maintenance performance scoring [from www.pride-in-maintenance.com]

1. Determine performance goal for each
2. Establish performance score range on 0-10 scale with your goal = 10. [The range limits you determine fit your tolerance for deviations.]
3. Read performance score for current period from 0-10 scale.
4. Determine importance (weighting factor) for each, for example between 2 and 15.
5. Weighted value of metric = (# 3) x (# 4)
6. Add them up and track totals.

Overall craft effectiveness
[from www.pride-in-maintenance.com]

• Overall craft effectiveness = (Craft utilization %) x (Craft performance %) x (Craft service quality)

• Craft utilization % = wrench time % [effectiveness]

• Craft performance % evaluates actual craft performance against a reasonable/reliable planned time for a planned repair job or task such as PM inspections. [efficiency]

• Craft service quality % is based on number of callbacks or % of craft rework and quality of maintenance repair work. It helps focus on “doing the repair right the first time.”
Overall equipment effectiveness
[from www.pride-in-maintenance.com]

• Comes from the TPM (Total productive Maintenance) concept

• **Overall equipment effectiveness / OEE**
  Factor = (Availability/Utilization %) x (Performance/Efficiency/Uptime %) x (Quality [subjective] %)

• World class OEE ~ 85%
  ○ Requires all 3 factors to be around 95%
Regulatory compliance benchmarking

• The old BMP: keep it going & use 95%+
• % of LS+EC tests completed on time
• % of LS+EC inspections completed on time
• % of adverse findings from LS+EC tests & inspections
• % SOC PFI items completed within budget
  ○ On time is a given, right ??? 😊
Benchmarking: Compliance Dashboard

- TJC SOC status
- TJC BMP status
- TJC Continuous Compliance status
- TJC PPR status
- TJC eSOC status
- Mock Survey scores
- Life Safety Code
- Utilities Annual Report
- Utilities Management Plan
- Safety Management Plan
- Emergency Operations Plan
- Other EC Mgmt Plans
- Hurricane Hardening: Windproofing; Floodproofing
- Sentinel Event Alert 37, other SEA’s
Benchmarking: Management Dashboard

- Strategic / Master Plan
- Labor hours / Bed / Year
- Labor hours / GSF / Year
- Project Management
- Asset Management
- Asset Tracking (RFID)
- CMMS / Work Order Management
- CMMS / P.M.'s
- Plan Room Management
### Sample benchmarking questionnaire

<table>
<thead>
<tr>
<th>Craft Parts plus Labor</th>
<th>Corrective Maintenance Costs</th>
<th>Preventive + Planned + Predictive Maintenance Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internal U.S. Dollars in thousands</td>
<td>Contractual U.S. Dollars in thousands</td>
</tr>
<tr>
<td>M1 HVAC/Mechanical</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>M2 Energy Management Systems/Controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3 HVAC Sub-total</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>M4 Electrical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M5 Elevators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M6 Plumbing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M7 Carpentry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M8 Painting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M9 Roofing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M10 Flooring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M11 General Labor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M12 General Trades Sub-total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M13 Clerical/Parts Ordering, Buyer/Contract Administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M14 Consulting Engineers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M15 Supervision and Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M16 Building Operators -- Central Plant Operations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Resource: [www.FMbenchmarking.com](http://www.FMbenchmarking.com)
Simple staffing surveys may not be enough

**Staffing Surveys**

At least three recent surveys have addressed hospital M&R staffing. The surveys are somewhat of a mixed bag in terms of staff definition, type of data collected, and sample size; no clear trend in staffing rates is evident, except that they fall within a broad range of between 12,000 and 63,000 square feet (sqft.) per M&R worker. Staffing rates are typically expressed in terms of square footage per worker—the larger the rate, the smaller the staff.

<table>
<thead>
<tr>
<th>M&amp;R Staff Definition</th>
<th>Staffing Estimate (sqft. per FTE)</th>
<th>Contract M&amp;R</th>
<th>Average Size (sqft.)</th>
<th>Sample Size</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear, probably does not include custodial workers</td>
<td>12,000 to 24,000</td>
<td>na</td>
<td>na</td>
<td>500</td>
<td>Brown, 1993</td>
</tr>
<tr>
<td>&quot;Skilled trades (incl. group supervisors)&quot;; does not include custodial workers</td>
<td>63,000 (mean)</td>
<td>33%</td>
<td>900,000</td>
<td>86</td>
<td>IFMA Benchmark II, 1994</td>
</tr>
<tr>
<td>&quot;Trade/Maintenance &amp; Supervisors&quot;; does not include custodial workers</td>
<td>22,817 (mean)</td>
<td>14%</td>
<td>667,000</td>
<td>50</td>
<td>New England Healthcare Engineering Society 1997</td>
</tr>
</tbody>
</table>

The variation in staffing rates among the surveys should be a source of discomfort to anyone attempting to generalize about M&R staff size. How do we explain the difference between the NEHES average of 22.8 thousand sqft. per FTE, and the IFMA rate almost three times higher? Some difference is undoubtedly due to staff definition and unmeasured differences, such as quality of construction or maintenance history among the surveyed hospitals. But another part can be due to systematic factors that can be measured. Likely candidates include hospital size, staff productivity, and the amount of work done by contract. These influences may seem intuitive—staff size should move inversely to the percentage of M&R work contracted (perhaps explaining the high rates found in the IFMA survey)—but to date there has been no attempt to quantify these roles.
NEHES 1996 staffing rates
50 hospital survey, ASHE 1997 Annual Conf

NEHES Staffing Rate

<table>
<thead>
<tr>
<th>Sqft (100k) per FTE</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>35</td>
<td>2</td>
</tr>
<tr>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>45</td>
<td>1</td>
</tr>
<tr>
<td>50</td>
<td>1</td>
</tr>
<tr>
<td>55</td>
<td>1</td>
</tr>
<tr>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>65</td>
<td>1</td>
</tr>
<tr>
<td>More</td>
<td>0</td>
</tr>
</tbody>
</table>
NEHES data, from 1998 Whitestone paper
Estimating Staff Size

To define an equation for estimating M&R staff size, we incorporated the variables noted above. The following model was estimated:

\[
\text{Maint FTE/100ksqft} = 9.20 - 7.55(\text{Contract\%}) - 0.000048(\text{AvgMaintSal}) - 0.094715(\text{Sft/100k})
\]

Details of the estimate (Appendix II) indicate that the overall model is statistically significant, though among the individual determinants only facility size (Sft/100k) was significant at the 95% probability level. We attribute the lack of significance of the other variables largely to measurement error—productivity and outsourcing clearly affect M&R staffing, though their influence is not evident in the NEHES data.

A simpler equation uses just facility size:

\[
\text{Maint FTE/100ksqft} = 6.117 - 0.1223(\text{Sft/100k})
\]
Predicted staffing rate from NEHES data (READ the 1998 Whitestone paper)
NEHES Data vs. CHMC of Cincinnati
Columns are averages of 5 NE hospitals w/ # beds

<table>
<thead>
<tr>
<th></th>
<th>Average Beds</th>
<th>Average Beds</th>
<th>Average Beds</th>
<th>Average Beds</th>
<th>Average Beds</th>
<th>Average CHMC Beds</th>
<th>Average Beds</th>
<th>Beds of All</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>78</td>
<td>113</td>
<td>160</td>
<td>180</td>
<td>283</td>
<td>313</td>
<td>349</td>
<td>508</td>
<td>720</td>
</tr>
<tr>
<td>Maint Cost</td>
<td>3.10</td>
<td>4.25</td>
<td>4.20</td>
<td>3.03</td>
<td>3.26</td>
<td>2.82</td>
<td>3.41</td>
<td>2.92</td>
<td>2.77</td>
</tr>
<tr>
<td>Utility Cost</td>
<td>4.03</td>
<td>3.50</td>
<td>3.84</td>
<td>3.48</td>
<td>3.08</td>
<td>3.15</td>
<td>3.36</td>
<td>3.86</td>
<td>4.19</td>
</tr>
<tr>
<td>Total Cost</td>
<td>7.13</td>
<td>7.75</td>
<td>8.04</td>
<td>6.51</td>
<td>6.34</td>
<td>5.97</td>
<td>6.77</td>
<td>6.78</td>
<td>6.96</td>
</tr>
<tr>
<td>FTE per 100,000 GSF</td>
<td>6.49</td>
<td>9.29</td>
<td>7.30</td>
<td>5.04</td>
<td>5.18</td>
<td>4.49</td>
<td>4.69</td>
<td>4.19</td>
<td>3.89</td>
</tr>
<tr>
<td>Total GSF</td>
<td>88000</td>
<td>141000</td>
<td>231000</td>
<td>338000</td>
<td>455000</td>
<td>565000</td>
<td>778000</td>
<td>1413000</td>
<td>2396000 700000</td>
</tr>
</tbody>
</table>

Table 1: Comparison of Fifty Northeastern U.S. Healthcare Facilities with CHMC

Source: [http://www.cibse.org/pdfs/Bechmarking%20at%20CHMC.pdf](http://www.cibse.org/pdfs/Bechmarking%20at%20CHMC.pdf)
“A Benchmarking Case Study at Children’s Hospital Medical Center, Cincinnati” by Thomas E. Kinman, P.E., Crestview Hills, KY, March 26, 2000
From www.plant-maintenance.com website
Benchmarking responses from ASHE/AHA ListServ

- 15,761 SF/FTE with a total of 142,000 SF for 6 behavioral health buildings (high damage).
- 28,571 SF/FTE for 209,000 SF multi-level healthcare (LTC, hosp, res care, med office, and 2 satellite clinics)
- 33,000 SF/FTE
- 35,000 SF/FTE, counting everybody in the dept. No roofs and parking lots/garages.
- 35,000 SF/FTE with Admin, 45,000 SF/FTE without for 450,000 SF on 2 sites with several out buildings.
- 35,000 to 45,000 SF/FTE
- 41,000 SF/FTE for 885,000 SF
- 52,000 SF/FTE not including FM
“You won't find a lot out there on this topic. I asked the same question a while back. I received quite a few individual responses and it seemed that the "average" target was 40,000 SF/FTE. Some facilities were as low as 26,000 SF/FTE, but I don't think that would be attainable in most cases. In my case, we were at about 36,000 SF/FTE a few years ago, but building additions and a few unfilled vacancies now have me up to about 53,000 SF/FTE. Even though 40,000 SF/FTE would be justified, I have set a goal for us to maintain a range of 45,000-50,000 SF/FTE and I believe we have convinced our administration that this is more than an acceptable staffing level, but still on the lean side.”

(Includes CEP, mgmt. Excludes grounds & biomed)
“I've seen a lot of benchmarking numbers used but have never seen anything that defines what is included in the number and what is not i.e. painting, regulatory staffing in boiler plants etc. Is this definition of what is, or is not, included standardized? I personally have some reservations about these numbers as they can be used by "bean counters " etc to etch in stone certain staffing levels. A real example of a little knowledge is a dangerous thing.

Second point is on what affects staffing needs. I've never seen intensity of usage directly factored into the equation. I have a 15 year old site with low clinical usage and minimal maintenance that is pristine yet I have other sites with very heavy clinical usage with comparatively high maintenance staffing levels but sites are in only fair condition-the sites are essentially being consumed by running them hard.”
“Our corporate engineering department advocates the old standard of 1 FTE/35,000 SF of hospital and 1 FTE/100,000 SF of MOB. However, we are closer to 1 FTE/55,000 SF in the hospital and 1 FTE/170,000 SF of MOB. This means we contract out quite a bit that we could do in-house otherwise. Most carpentry, all painting, larger plumbing, electrical, and HVAC, etc. Also, 85 to 90% of our >400,000 SF main facility is either renovated or new in the last 10 years.”
# System-wide capital benchmarking example

## Overall capital budget needs

<table>
<thead>
<tr>
<th>Health System Name</th>
<th>MEPF Infrastructure Equipment/System Capital Plan</th>
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<tbody>
<tr>
<td>Facility</td>
<td>Comments</td>
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<table>
<thead>
<tr>
<th>Facility</th>
<th>Enter Gross Sq Ft Below</th>
<th>DOLLARS BY FY</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td>Facility Name 1</td>
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<tr>
<td><strong>TOTALS</strong></td>
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## DOLLARS PER SQUARE FOOT BY FY

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<tr>
<th>Facility</th>
<th>Enter # of Beds Below</th>
<th>DOLLARS PER BED BY FY</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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*Note: The table includes columns for each facility and years from 2010 to 2014, with placeholders for costs and calculations.*
## System-wide capital benchmarking example

Drill down to major discipline level per facility

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<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<tbody>
<tr>
<td><strong>TOTAL SYSTEM-WIDE: MAJOR DISCIPLINES</strong></td>
<td><strong>TOTALS</strong></td>
<td>2010</td>
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<td>2012</td>
<td>2013</td>
<td>2014</td>
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<tr>
<td>40</td>
<td>Mech., Plbg, MedGas, FP, FO, DW</td>
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<td>#REF!</td>
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<td>#REF!</td>
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<td>#REF!</td>
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<tr>
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<td>Energy/Utility Mgmt/Conserv; BAS</td>
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<td>#REF!</td>
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<td>43</td>
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<td>44</td>
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<td>Other</td>
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<tr>
<td><strong>BY FACILITY: MAJOR DISCIPLINES</strong></td>
<td><strong>TOTALS</strong></td>
<td>2010</td>
<td>2011</td>
<td>2012</td>
<td>2013</td>
<td>2014</td>
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<td>48</td>
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<td>Electrical</td>
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<td>Low Voltage Systems</td>
<td>Compliance</td>
<td>Other</td>
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<td>49</td>
<td>Facility Name 2</td>
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<td>Electrical</td>
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<td>Compliance</td>
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<td>50</td>
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<td>Energy/Utility Mgmt/Conserv; BAS</td>
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<td>Compliance</td>
<td>Other</td>
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</tbody>
</table>
# System-wide capital benchmarking example

Data at hospital system/equipment level

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>A</th>
<th>B</th>
<th>C</th>
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<th>L</th>
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<th>N</th>
<th>O</th>
<th>P</th>
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<tbody>
<tr>
<td><strong>System</strong></td>
<td><strong>Major Equipment</strong></td>
<td><strong>Manufacturer</strong></td>
<td><strong>Rating</strong></td>
<td><strong>Type / Model</strong></td>
<td><strong>Condition</strong></td>
<td><strong>Installed Age in 2016</strong></td>
<td><strong>Replace by</strong></td>
<td><strong>Comments</strong></td>
<td><strong>Facility</strong></td>
<td><strong>Category</strong></td>
<td><strong>Year &amp; Priority</strong></td>
<td><strong>2010</strong></td>
<td><strong>2011</strong></td>
<td><strong>2012</strong></td>
<td><strong>2013</strong></td>
<td><strong>2014</strong></td>
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Other references

• “Estimating the Size and Composition of the Hospital Maintenance Staff” by Peter Lufkin, Whitestone Research. 
  http://www.whitestoneresearch.com/reports/pdf/Hospital_Staffing_Notes.pdf

• “A Benchmarking Case Study at Children’s Hospital Medical Center, Cincinnati, Ohio: Its History, Its Current Use, and Its Comparison to Industry Data” March, 2000. 
  http://www.cibse.org/pdfs/Bechmarking%20at%20CHMC.pdf
Thank you. Questions anyone?

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Cell 504.232.1113
DStymiest@ssr-inc.com