

Operations and Maintenance BENCHMARKS for Health Care Facilities Report



OPERATIONS AND MAINTENANCE BENCHMARKS FOR HEALTH CARE FACILITIES COMMITTEE

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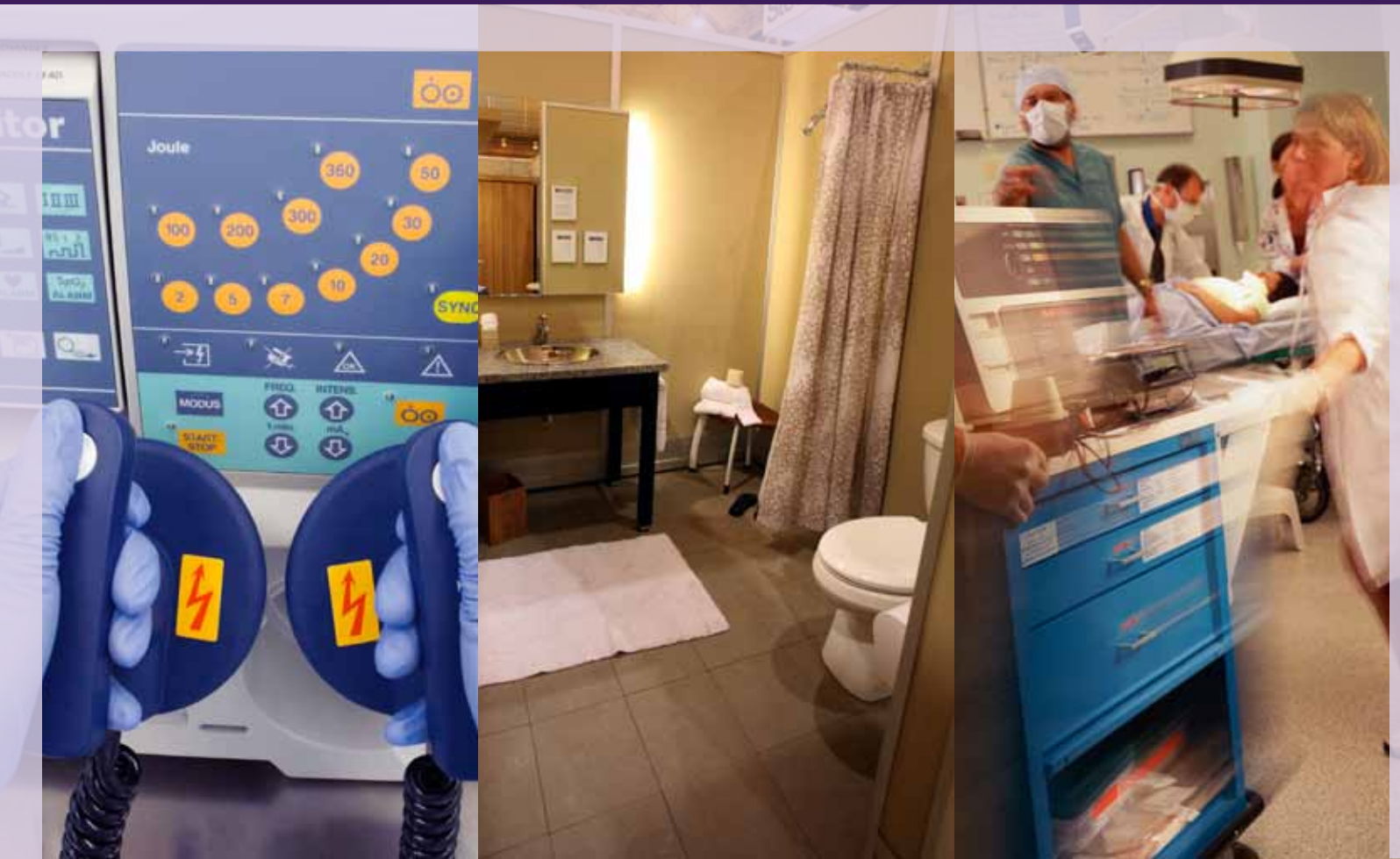


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Introduction



We are pleased to have completed the first significant benchmarking in health care facility management operations as a combined effort of the International Facility Management Association (IFMA) Health Care Council and American Society for Healthcare Engineering (ASHE). The IFMA Health Care Council and ASHE joined in a collaborative effort with the signing of a Memorandum of Understanding on October 25, 2007. This combined effort joined IFMA's expertise in facility management with the expertise of the ASHE in health care engineering to produce this significant work.

For those of us that work in facility operations for acute care hospitals know only too well how important it is to have good data not only on cost but metrics of cost to establish productivity measures, metrics of our contributions to the overall business and the resulting appropriate allocation of precious resources. Collaborative benchmarking at the FM and C-Suite levels has proven to be an absolute in winning together.

I sincerely thank each and every one of our IFMA and ASHE members as well as other health care professionals who participated in completing this inaugural benchmarking survey. We also acknowledge the contribution of the members' support staff who assisted in collecting the necessary data to respond to the questionnaire. It is our hope we can continue this effort to update the work every couple of years.

A special thanks to Tim Adams, ASHE's Director of Professional Development; Todd Wilkening VP of Research of IFMA's Health Care Council; and Shari Epstein, IFMA's Director of Research for their tireless efforts and passion in making the final result a reality.

William L Gregory, PE, CFM, IFMA Fellow
President
IFMA Health Care Council

USING THIS REPORT

The information contained in the report represents a “self-report” from ASHE and IFMA members. All information was voluntarily provided but was not checked with site visits. When interpreting the data, it is important to remember that every facility is different, and every organization operates using different accounting and measuring practices. The data listed in this report will not provide a perfect comparison of your organization to that of another hospital, but it should give you a good idea how your facility fits into the range of performance.

The percentile charts in this report allow you to see how your operation ranks against other organizations. The arrows beside some charts show the “best-in-class” direction. Using your facility’s numbers for the performance indicator, determine whether your building is above or below the median (50th percentile). If your facility falls way above or below the median, you may want to examine your cost or procedures in that area. However, your hospital may differ from the median due to type of facility, climate, or labor market. The data should help you identify areas where you can improve your facility operation.

Readers will see arrows pointing in an upward or downward direction next to several of the percentile charts in this report. In many cases the arrow points toward the lowest cost; however, the organization with the lowest cost may not profess to have the best practice. There may be a reason why a cost is so low. For example, a hospital building scheduled for demolition would likely apply minimal resources and thus costs would be lower.

Using this report is the first step in benchmarking. After you have identified areas where your facility operations could be improved, you should conduct additional research before reengineering the process. One should not immediately rush to find out which health care organization is “best in class” and copy their practice. Instead you should look for a more homogeneous group in which to compare.

ACKNOWLEDGEMENTS

IFMA and ASHE rely on the willingness and generosity of their members to compile the data and complete this lengthy benchmarking survey. Without their data, there would be no report. We thank these dedicated participants for their contribution. We are thankful for their support to this initial endeavor between the two organizations.

ABOUT THIS REPORT

To create this report, a committee of ASHE and IFMA volunteers with expertise in environmental services, maintenance, energy management reviewed questions posed in previous IFMA and ASHE surveys and developed new questions to better match today’s practices. Once tested, the 10-page survey was sent electronically in March 2009 to more than 10,000 members in the United States and Canada. Although the survey was issued to ASHE and IFMA members, membership was not a requirement to participate. Survey recipients were encouraged to circulate the survey to the person responsible for the activity.

Findings are discussed in the sections that follow. Statistically significant findings are integrated in the text of the report. When applicable, comparisons are made to previous benchmarking reports. Additional copies of this report may

be ordered through IFMA’s and ASHE’s bookstores.

METHODOLOGY

The Operations and Maintenance Benchmarks for Health Care Facilities survey was developed in fall of 2008. The committee used a 2005 IFMA questionnaire, adding many questions specific to health care facilities such as environmental and linen services. Committee members examined each question to make sure questions were clear, unambiguous, concise and relevant. Questions were asked in an objective fashion in order to obtain responses that are truly representative of industry practices.

The survey was created as an Adobe .pdf interactive form document. In March 2009, IFMA and ASHE members received an e-mail directing them to a link on IFMA’s website where they could download the electronic survey. Respondents were asked to provide information on the facilities they manage for a 12-month period of time. Many chose to report the data for calendar year 2008. A total of 151 surveys were returned during a nine-month period. A completion rate of 50 percent was considered usable.

To ensure high quality data, highly structured coding and data verification procedures were used. In addition, all variables and values were checked to verify that they were within appropriate ranges and inappropriate outliers were corrected or removed. The majority of open-ended responses were read and coded into quantifiable variables to assist in analysis of the data. A full statistical analysis followed, using SPSS-PC™. IFMA used nonparametric and bivariate statistical techniques to conduct the data analysis. Standardized data analysis procedures included reviewing

Introduction

descriptive frequency counts and cross tabulations of responses for variables of interest.

To maintain real world usability of these research findings, statistics are most often provided in terms of absolute number of responses, percentages and mean averages. Percentages may not add to 100 percent due to rounding or the acceptance of multiple responses. In many cases, some respondents did not answer all questions, so the base numbers differ among the findings. Several tables have blanks in lieu of a number because there were not enough responses to generate a valid statistic.

Additional calculations were made to determine cost and utility consumption per square foot, square footage per occupant and cost per discharge. Utility consumption data was changed to match the unit specified. Canadian cost data was converted to U.S. currency by multiplying costs by a factor of 0.96, the currency exchange rate on January 28, 2010. Metric numbers were converted to standard. If data appeared out of range, the respondent was contacted to determine how the information was derived and new information was subsequently entered.

This report contains the results of those analyses deemed to be of most interest to facility managers within the health care sector. *Operations and Maintenance Benchmarks for Health Care Facilities* is a self-report survey. All data, including respondent identification, was voluntary. As with any research, readers should exercise caution when generalizing results and take individual circumstances and experiences into consideration when making decisions based on these data. While IFMA is confident in its research, it is important to

understand that the results presented in this report represent the sample of organizations that chose to supply the requested facility information.

A confidence level and margin of error provide readers some measure of how much they can rely on survey responses to represent all IFMA member organizations. Given the level of response to this survey, IFMA is 95% confident that responses given by all responding organizations can be generalized to all IFMA member organizations, in general with a margin of error of approximately +/- 8.0%. For example, 83% of the respondents reported that conduct facility related customer satisfaction surveys. With an 8% margin of error for the sample size of 125, the reader can be 95% certain that between 75% and 91% of all managers within health care settings collect some type of facility related customer satisfaction data. It is important to note that as the sample size decreases, which occurs in many of the tables, the margin of error increases. For example, a smaller sample of 150 decreases the margin of error to +/- 8%.

Definitions for Operations and Maintenance Benchmarks for Health Care Facilities Report

ADJUSTED PATIENT DAYS

This figure is used as a way to standardize the per unit measure between hospitals allowing for more valid comparisons. Adjusted patient days is calculated by dividing total charges by inpatient charges, then multiplied by the number of inpatient days and admissions. $(\text{Gross Revenue}/\text{Inpatient Revenue}) \times \text{Inpatient Patient Days}$

ADJUSTED DISCHARGES

Adjusted discharges is a calculation that adjusts the number of discharges (hospitalizations) to reflect the impact of both inpatient and outpatient volume. The formula is as follows: $(\text{Total Gross Revenue}/\text{Inpatient Gross Revenue}) \times \text{Discharges (or days)}$. For this report, we used adjusted discharges as a means to compare costs.

AHU

Air Handling Unit (AHU) - a device used to condition and circulate air as part of a heating, ventilating, and air-conditioning system.

AVERAGE

Average is also referred to as the mean – the sum or total of all responses divided by the number of respondents.

BAS

Building Automation System (BAS) use computer-based monitoring to coordinate, organize and optimize

building control sub-systems such as security, fire/life safety, elevators, etc.

CAD

Computer-aided design (CAD) is the use of computer technology to aid in the design and especially the drafting (technical drawing and engineering drawing) of a part or product, including entire buildings. It is both a visual (or drawing) and symbol-based method of communication whose conventions are particular to a specific technical field.

CAFM

Computer Aided Facility Management (software application)

CAM CHARGES

Common Area Maintenance charges are the amounts charged to tenants for expenses to maintain hallways, restrooms, parking lots, and other common areas.

CMMS

Computerized Maintenance and Management System (software application)

CENTRAL MECHANICAL PLANT

A plant that is owned by, and on the grounds of, a multi-building facility that provides district heating, district cooling, or electricity to one or more buildings on the same facility. The central physical plant may be by itself in a separate building or may be located in a building where other activities occur.

CLIMATE ZONES

The U.S. Department of Energy's Energy Information Administration issues a Commercial Buildings Energy Consumption Survey (CBECS) every few years which includes five climate zones based on its 30-year average heating degree-days (HDD) and cooling degree-days (CDD)

for the period 1971 through 2000. Designation of a climate zone serves as an indicator of heating and air condition use.

Climate Zone	Cooling Degree Days (CDD)	Heating Degree Days (HDD)
1	2,000 <	More than 7,000
2	2,000 <	5,500 to 7,000
3	2,000 <	4,000 to 5,499
4	2,000 <	4,000 <
5	2,000 or More	4,000 <

Natural Resources Canada's Office of Energy Efficiency (OEE) regionalizes Canada into four climate zones. These four zones are based upon an average number of heating degree-days over a 30-year period.

Climate Zone	Heating Degree Days (HDD)
1	≤ 3500
2	> 3500 to ≤ 5500
3	> 5500 to ≤ 8000
4	> 8000

COOLING DEGREE-DAY (CDD)

A measure of how warm a location is over a period of time relative to a base temperature, most commonly specified as 65° Fahrenheit. The measure is computed for each day by subtracting the base temperature (65°) from the average of the day's high and low temperatures, with negative values set equal to zero. Each day's cooling degree-days are summed to create a cooling degree-day measure for a specified reference period. Cooling degree-days are used in energy analysis as an indicator of air conditioning energy requirements or use. (Department of Energy, Energy Information Administration)

COST OF OPERATIONS

Annual cost of operation includes the total costs associated with the day-to-day operation of a facility. It

Introduction

includes all maintenance and repair costs (both fixed and variable), administrative costs (clerical, time-keeping, general supervision), labor costs, janitorial, housekeeping and other cleaning costs, utility costs and indirect costs, i.e. all costs associated with roadways and grounds.

CURRENT REPLACEMENT VALUE

Current replacement value is defined as the total amount of expenditure in current dollars required to replace the organization's facilities to its optimal condition (excluding auxiliary facilities). It should include the full replacement cost for all buildings, grounds, utility systems, and generating plants. Furthermore, it should meet the current acceptable standards of construction and comply with regulatory requirements. Insurance replacement values or book values should not be used. Current replacement value does not include cost of contents.

DEFERRED MAINTENANCE

Deferred maintenance is defined as the total dollar amount of existing major maintenance repairs and replacements identified by a comprehensive facilities condition audit of buildings, grounds, fixed equipment, and infrastructure needs. This estimate should not include projected maintenance, replacement or other types of work, such as program improvements or new construction, for these items are considered capital projects.

EXTERIOR GROSS AREA

The area of the floor measured to the outside face of the walls that enclose the floor(s) of the building. (ASTM E1836-08)

FACILITY OPERATING CURRENT REPLACEMENT VALUE (CRV) INDEX

This indicator represents the level of funding provided for the stewardship responsibility of an organization's capital assets. The indicator is expressed as a ratio of annual facility maintenance operating expenditure to Current Replacement Value (CRV). (Asset Lifecycle Model for Total Cost of Ownership Management, 2005)

FACILITY MANAGEMENT

Facility management is a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place process and technology.

FUEL OIL

A liquid petroleum product used as an energy source that is less volatile than gasoline. Fuel oil includes distillate fuel oil (Nos. 1, 2, and 4), but this study requested consumption of fuel oil #2.

FULL-TIME EQUIVALENT

A full-time equivalent is a measurement that standardizes the mix of part-time and full-time employees within a fiscal year. The measurement reflects the number of people necessary in terms of full-time status by dividing the total number of paid hours in a year by a factor of 2,080 hours.

GROSS SQUARE FOOT (GSF)

Basis used for most calculations used in this report.

HEATING DEGREE-DAY (HDD)

USA: A measure of how cold a location is over a period of time relative to a base temperature, most commonly specified as 65° Fahrenheit. The measure is computed for each day by subtracting the average of the day's high and

low temperatures from the base temperature (65°), with negative values set equal to zero. Each day's heating degree-days are summed to create a heating degree-day measure for a specified reference period. Heating degree-days are used in energy analysis as an indicator of space heating energy requirements or use. (Department of Energy, Energy Information Administration)

Canada: A measure of the severity of the weather. One degree day is counted for every degree that the average daily temperature is below the base temperature of 18° Celsius. For example, if the average temperature on a particular day was 12° Celsius, six degree days would be credited to that day. The annual total is calculated by simply adding the daily totals. (Natural Resource Canada, Office of Energy Efficiency)

INTERIOR PARKING SPACE

The space used for vehicular parking space that is totally enclosed within the (occupied) building envelope.

KILOWATT HOUR (KWH)

A unit of work or energy, measured as 1 kilowatt (1,000 watts) of power expended for 1 hour. One kWh is equivalent to 3,412 Btus.

MAJOR VERTICAL PENETRATIONS

Major vertical penetrations include stairs, elevator shafts, utility tunnels, flues, pipe shafts, vertical ducts and their enclosing walls.

MEAN

See definition for average. Mean and average are used interchangeably and the interpretation is the same.

MEDIAN

The middle value in a range of responses is the median. One-half of all respondents will be below this

value, while one-half will have a higher value. The median is also known as the 50th percentile. The advantage in using the median is that it is not affected as much by extreme highs or lows in the range of values as is the case with the mean.

N
N is the number of cases supplying the data being described. It is important to note the size of the sample for the value you are comparing.

PERCENTILE

Indicates dispersion of data and a specific percentile identifies where a value lies in relation to other values in a range of responses. The 25th percentile is the lower one-fourth point in the range of values in the group. The 50th percentile, also referred to as the median, represents a value of which one-half of the group falls below and one-half falls above. The median is not affected by extreme high or low values whereas the mean could be distorted.

PLANNED GROSS AREA

The portion of the floor that is totally enclosed within the interior face of perimeter encroachments at the floor plane and where there are no perimeter encroachments enclosed at the inside finished surface of the exterior walls. To obtain plannable gross area, one would subtract exterior gross to dominant portion, excluded areas, interstitial areas, restricted headroom areas, interior parking and perimeter encroachments from Exterior Gross Area. (ASTM 1836-08)

PREVENTIVE MAINTENANCE

Planned actions undertaken to retain an item at a specified level of performance by providing repetitive scheduled tasks which prolong system operation and a useful life; i.e. inspection, cleaning, lubrication, part replacement. (Cotts, Lee, 1992)

REPAIR MAINTENANCE

Work that is performed to put equipment back in service after a failure, to extend life of the equipment, or to make its operation more efficient. (Armstrong, 1996)

SITE POPULATION

The number of full- and part-time employees, contract workers and/or tenants located at the facility(ies).

STATIONARY ENGINEERS

Stationary engineers (also called licensed engineers) are licensed personnel assigned to operate a power plant including the steam and hot water boilers or a chilled water plant. Some states and municipalities require licensed engineers watch 24 hours, seven days per week. Further, these individuals are not allowed to leave the power plant to perform maintenance outside the power plant.



FACILITY DESCRIPTION

Industries Represented

Facility Description

Location of Hospital

Hospitals by Region

Climate Zones for the United States. and Canada

Facility Age

Facility Setting

Ownership

Developed Acres

Days and Hours of Operations

Central Plant

Staff Size

Operating Budget

Facility Size

Adjusted Patient Days and Discharges

Space per Occupant

Customer Satisfaction



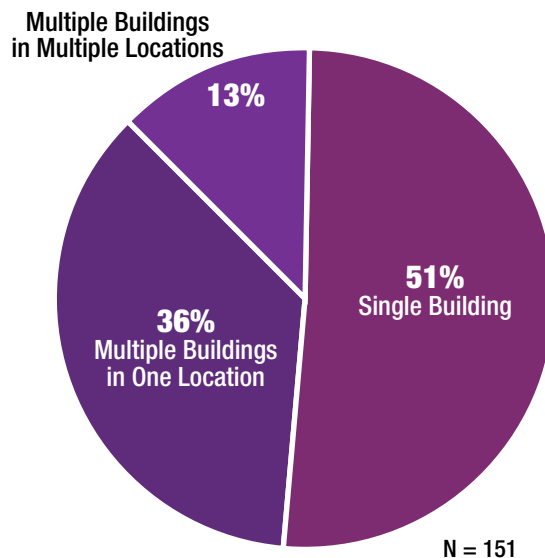
Institutions Represented

The chart below describes the types of institutions that participated in this benchmarking study. With a total of 151 hospitals responding to the survey, the distribution of institutions represented were skewed toward large acute care hospitals and medical centers.

Institution	Number of Cases (N)	Percentage of Sample	Definition
Acute Care Hospital	101	67%	An institution that is primarily engaged in providing diagnostic and therapeutic services for medical diagnosis, treatment, and care, by or under the supervision of physicians, to injured, disabled, or sick persons or rehabilitation services for injured, disabled, or sick persons.
Behavioral Care Facility	1	1%	An outpatient treatment center for psychiatric and mental disorders, Alzheimer's and developmentally disabled. Outpatient and psychiatric counseling for substance abuse patients.
Outpatient Healthcare Center	1	1%	An outpatient clinic where persons can receive a wide range of medical services including diagnostic services, laboratory services and imaging.
Ambulatory Surgery Center	1	1%	Any distinct entity that operates exclusively for the purpose of providing surgical services to patients not requiring hospitalization
Critical Access Hospital	6	4%	Critical Access Hospitals (CAH) are rural community hospitals that receive cost-based reimbursement.
Medical Center	32	21%	A large medical complex that provides a comprehensive array of health care services in both outpatient and inpatient settings.
Rehabilitation Center/Hospital	8	5%	A recovery facility oriented toward long-term treatment and training of sick/injured persons so they can function in society. Rehabilitation centers specialize between either physical therapy for trauma/stroke victims.

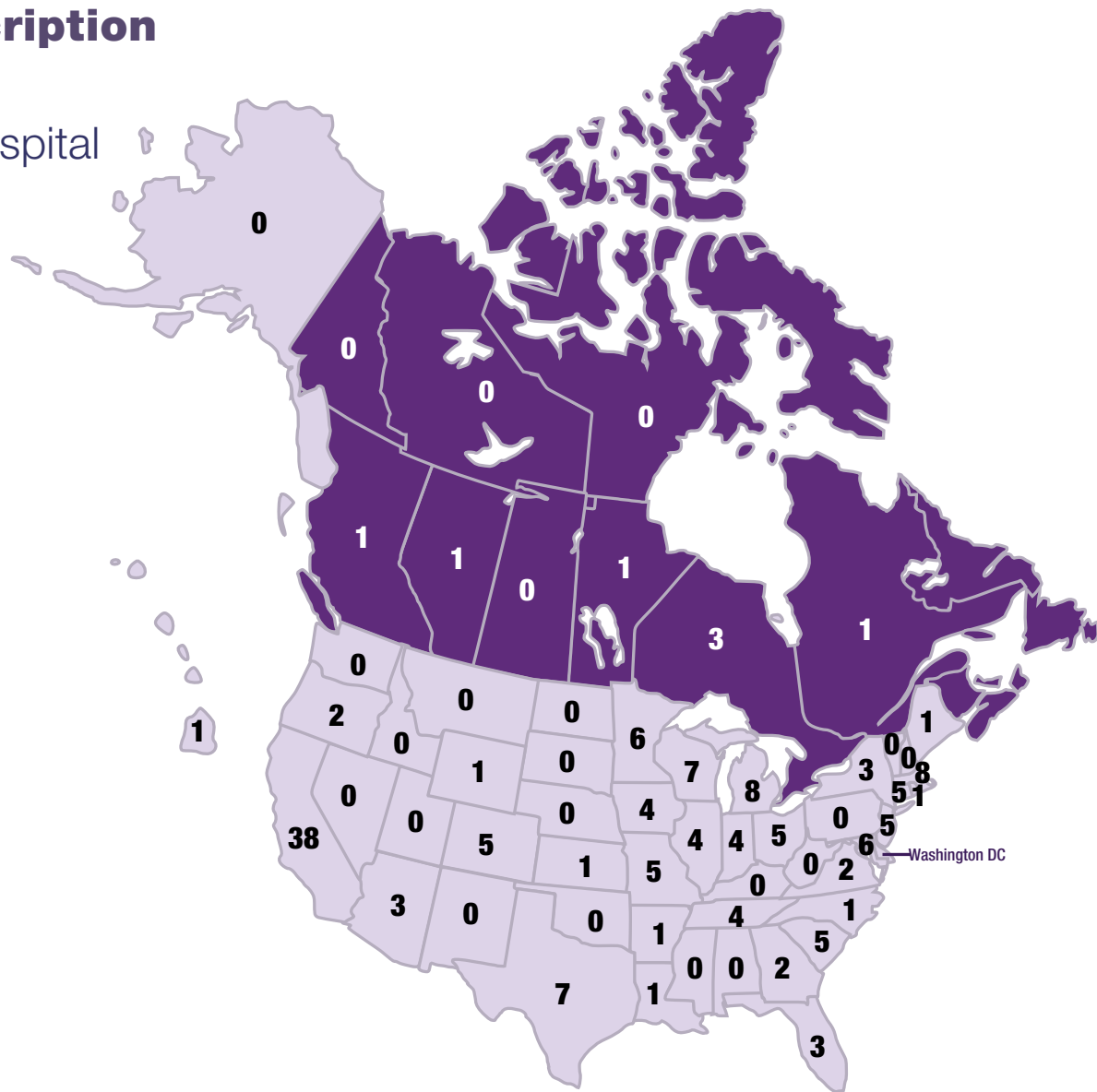
Facility Description

To provide a more accurate comparison of costs and practices, respondents were asked to report on a single building, preferable the largest or most active. Half of the respondents were able to do so. The balance reported on campus locations with an average of six buildings and remote locations.



Facility Description

Location of Hospital



Hospitals by Region

This report breaks out North America into 11 regions. The 10 United States categories are based upon postal zip codes. For example, the region labeled Pacific is composed of the five states in which the zip code begins with the number nine.

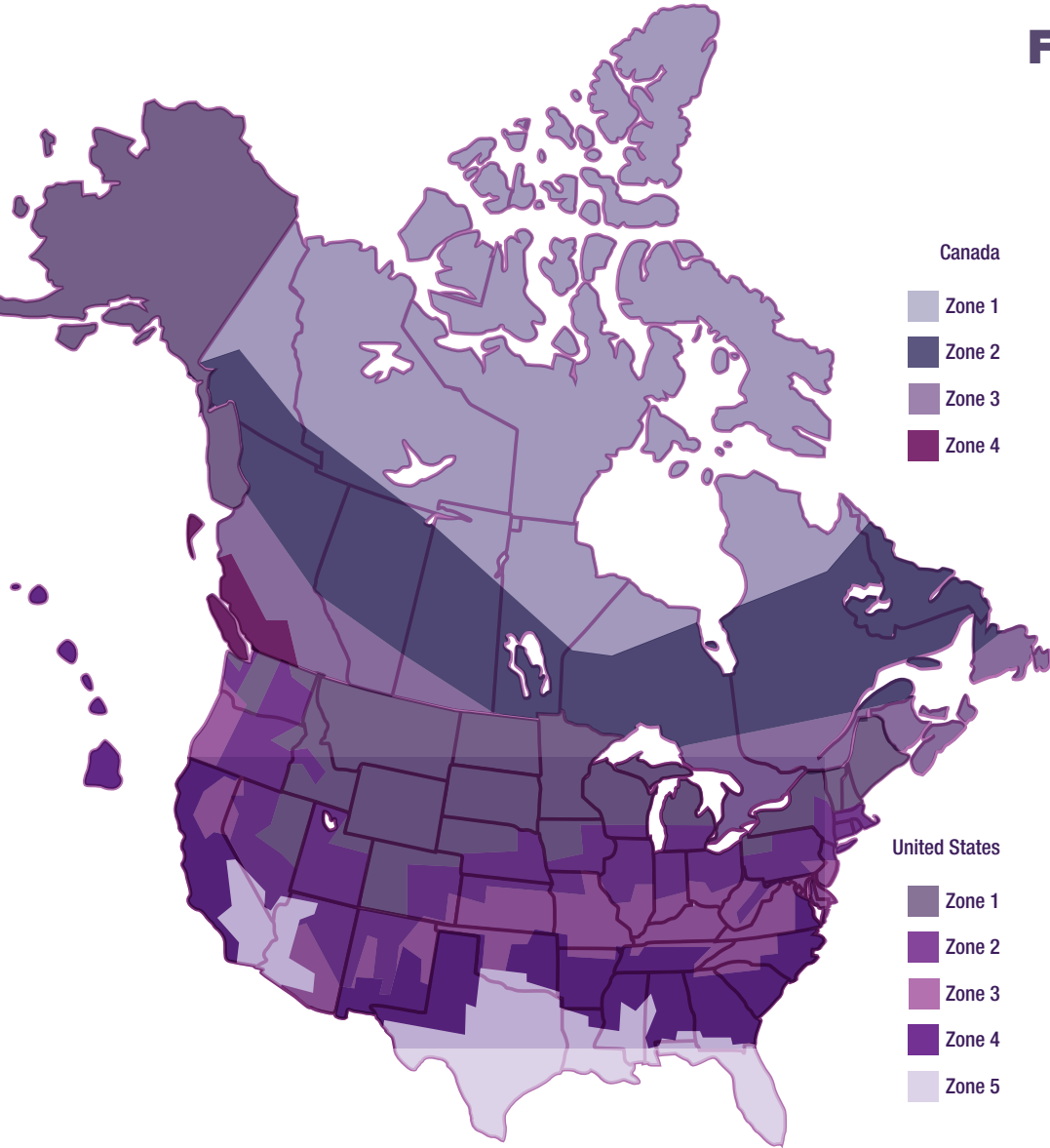
Region	N	Percentage of Sample
Canada (AB, BC, MB, ON, QC)	7	5%
New England (CT, MA, ME, RI)	15	10%
Northeast (NY, NJ)	8	5%
Mid-Atlantic (DC, NC, SC, VA)	9	6%
Southeast (FL, GA, TN)	9	6%
Midwest (IN, MI, OH)	17	11%
North Central (IA, MN, WI)	17	11%
Heartland (IL, KS, MO)	10	7%
South Central (AR, LA, TX)	9	6%
Mountain (AZ, CO, WY)	9	6%
Pacific (AK, CA, HI, OR, WA)	41	27%

Facility Description

Climate Zones for the United States and Canada

Climate and severe weather shifts can adversely affect hospitals' energy consumption and landscaping costs. For that reason, respondents were asked to select the climate zone which best corresponded to the location of the reported hospital.

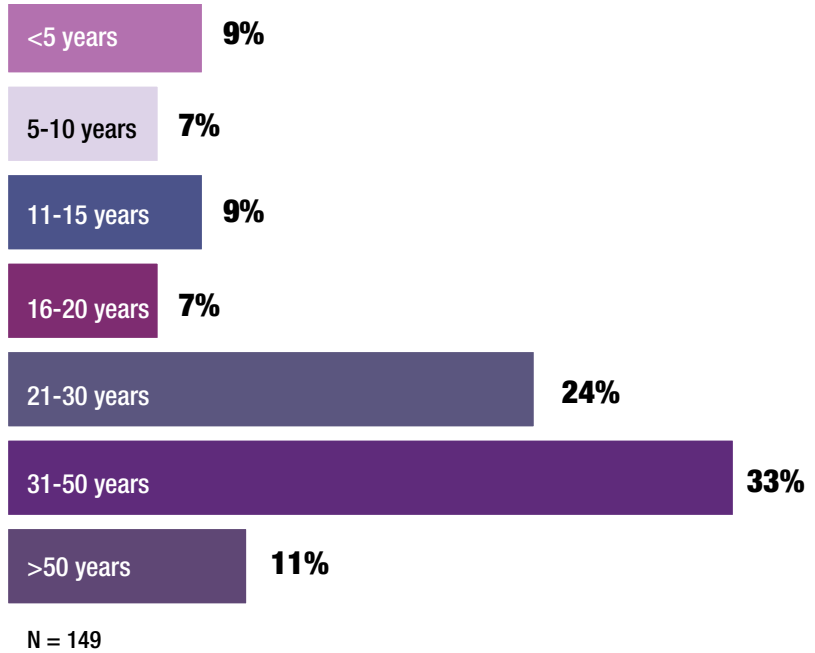
The U.S. Department of Energy (DOE) classifies the United States into five climate zones which are derived by averaging the number of annual heating and cooling degree-days in a 30-year period. Natural Resources Canada's Office of Energy Efficiency (OEE) regionalizes Canada into four climate zones. These four zones are based upon an average number of heating degree-days over a 30-year period.



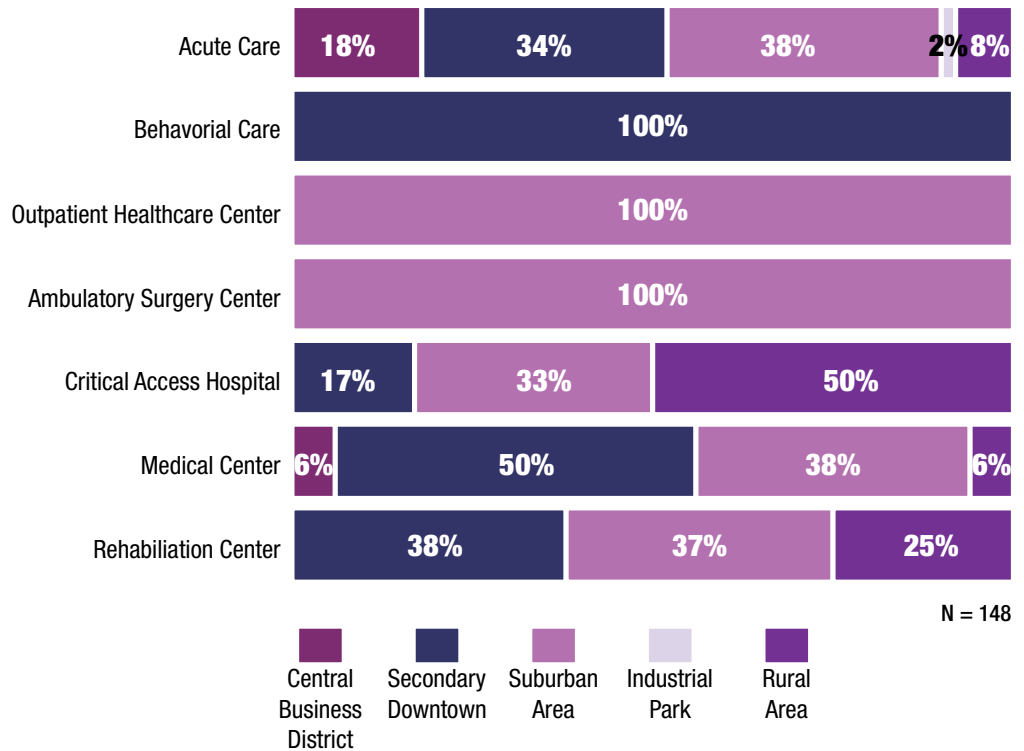
Climate Zone	N	Number of Heating Degree Days	Number of Cooling Degree Days
US 1 (coldest)	23	More than 7,000	Less than 2,000
US 2	33	5,500 to 7,000	Less than 2,000
US 3	24	4,000 to 5,499	Less than 2,000
US 4	47	Less than 4,000	Less than 2,000
US 5 (warmest)	17	Less than 4,000	2,000 or More
CN 1 (coldest)	1	More than 8,000	
CN 2	3	5,501 to 8,000	
CN 3	3	3,500 to 5,599	
CN 4 (warmest)	0	Less than 3,500	

Facility Description

Facility Age

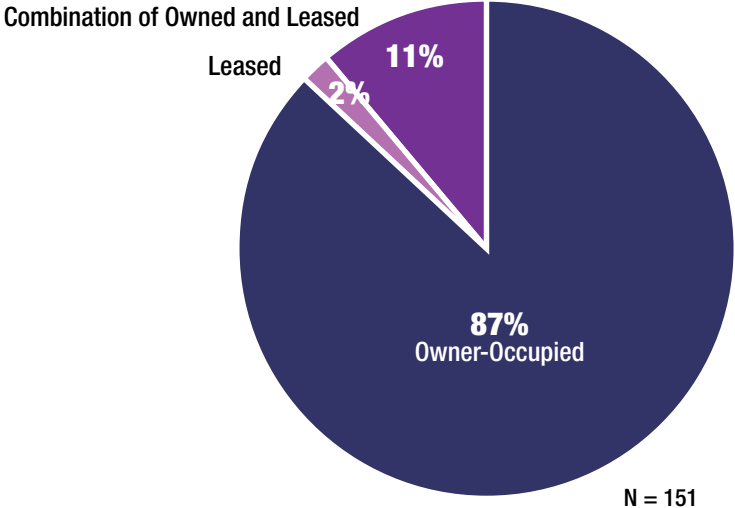


Facility Setting



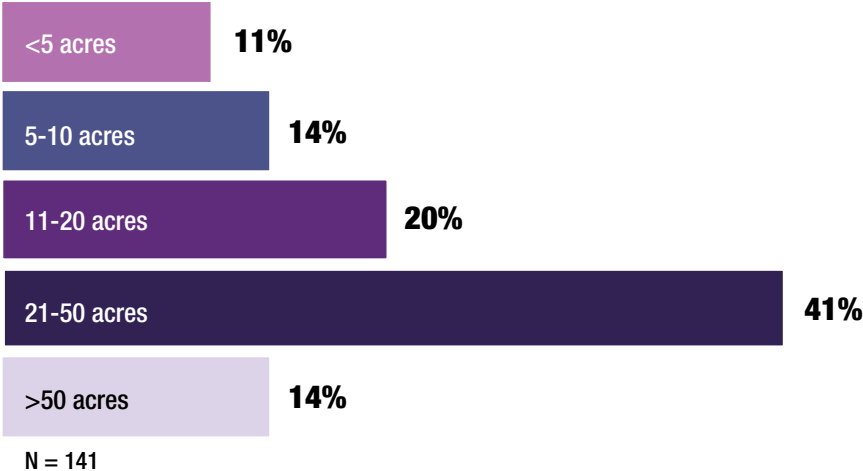
Facility Description

Ownership



Developed Acres

In this report, the annual cost of maintaining roads and grounds is derived by dividing cost by the number of developed acres.



Facility Description

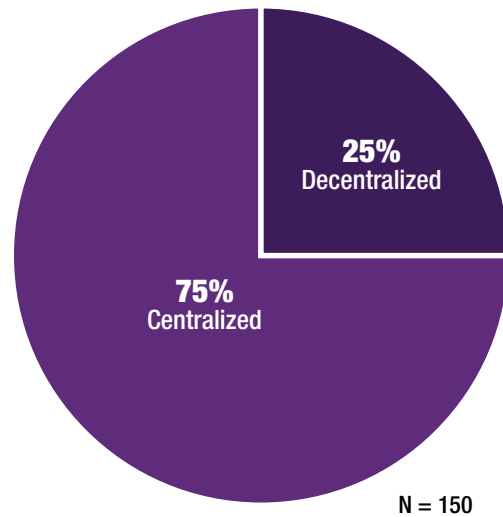
Days and Hours of Operations

As with most health care institutions, most of the facilities in this study operate round the clock and are cooled and heated accordingly. There are a few ambulatory and outpatient centers which close which is why the overall average is less than 24 for this sample.

Institutions	N	Hours/Day	Days/Week
Acute Care	101	24	7
Medical Center	32	24	7
Rehabilitation Center	8	24	7
Critical Access	6	24	7
Overall Average	150	23.8	6.9

Central Plant

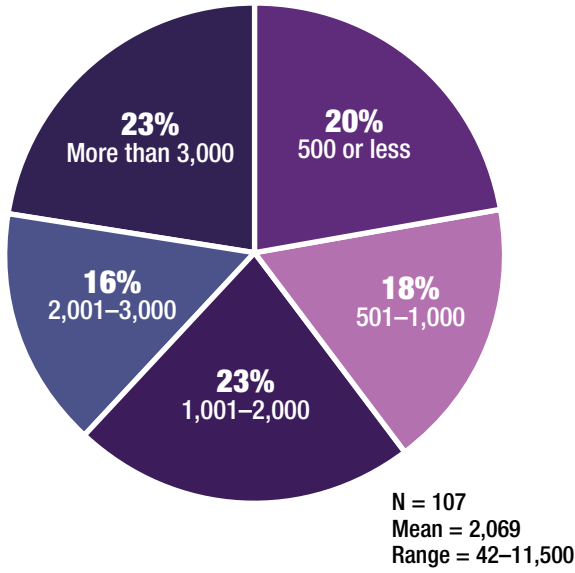
Given the size and complexity of the hospitals represented in this study, it is fitting that 75% of the sample derive power from a central mechanical plant.



Facility Description

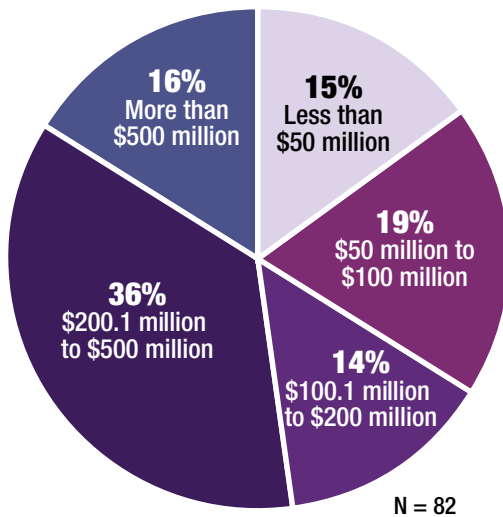
Staff Size

To gauge the size of the facility and determine density, respondents were asked to quantify the number of occupants they serve. Site population includes the average number of full-time, part-time and contract workers who occupy space over a 12-month period.



Operating Budget

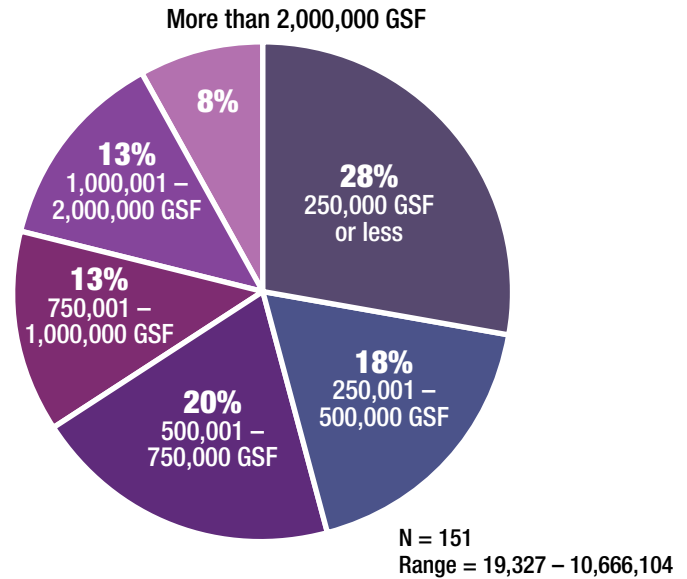
More than half of the hospitals report an annual operating budget exceeding \$200 million. This sample reflects either a 2008 or 2009 fiscal year budget.



Facility Size

Plannable Gross Area

All of the respondents provide area in square feet, using IFMA's measurement for plannable gross area. To provide uniformity, all of the annual costs reported are divided by this measurement. Plannable gross area is the portion of the floor that is totally enclosed within the interior face of perimeter encroachments at the floor plane and where there are no perimeter encroachments enclosed at the inside finished surface of the exterior walls. Excluded areas, interstitial areas, restricted headroom areas, interior parking and perimeter encroachments are excluded from plannable gross. For the balance of the report, square footage is referred to as gross.

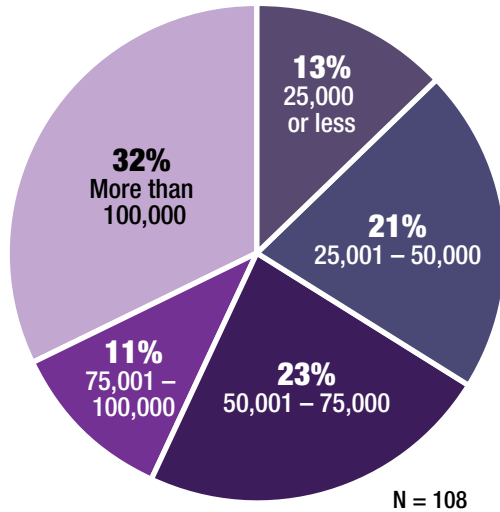


Percentile	Gross Square Feet
99	8,186,431
95	2,902,518
90	1,495,249
75	873,525
50	553,428
25	225,000
10	97,956
5	51,031
1	20,716
Mean	825,347

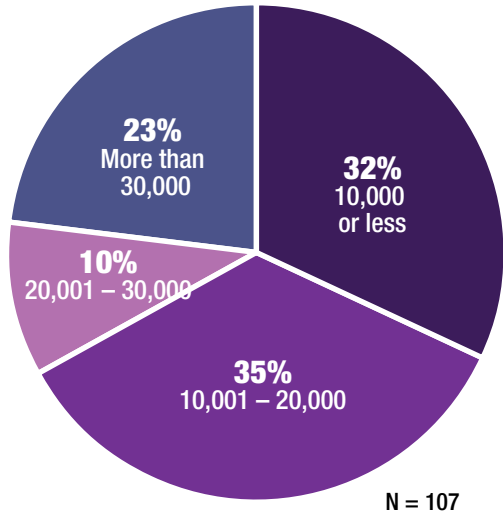
N = 151

Institution	N	Gross Sq. Ft.	
		Mean	Median
Acute Care	101	737,144	553,428
Medical Center	32	1,454,408	755,250
Rehabilitation Center	8	249,135	130,000
Critical Access	6	140,439	108,823

TOTAL ADJUSTED PATIENT DAYS



TOTAL ADJUSTED DISCHARGES



Adjusted Patient Days and Discharges

Unlike other industries that rely exclusively dollar per square foot as a metric of operational efficiency, hospitals also use cost per adjusted discharge and cost per adjusted patient day.

Respondents were asked to provide adjusted discharges and adjusted patient days, as these figures help standardize the per unit measure between hospitals allowing for more valid comparisons. Here are the calculations used for these two indicators:

Adjusted Patient Days

$(\text{Gross Revenue} / \text{Inpatient Revenue}) \times \text{Inpatient Patient Days}$

Adjusted Discharges

$(\text{Total Gross Revenue} / \text{Inpatient Gross Revenue}) \times \text{Discharges (or days)}$

For this report, adjusted discharges were selected to be used as a denominator for costs and other consumption data.

Facility Size

Space per Occupant

Even though hospitals are more likely to use adjusted patient days and adjusted discharges as a means to measure throughput, this report also includes a space per person measurement. This was done by dividing gross and plannable gross square feet by the number of full-time equivalents who work at the institution.

Percentile	Square Foot per Occupant	
	Gross	Plannable Gross
99	1,095	1,059
95	947	882
90	772	708
75	516	464
50	417	380
25	309	281
10	252	242
5	224	200
1	121	50
Mean	457	414

N = 127

Customer Satisfaction

Hospitals often conduct patient surveys. We learned from this group that 83% also capture facility-related data from customers, patients and tenants.

%	Information Collected
95%	Overall satisfaction
76%	Satisfaction with environmental comfort
56%	Satisfaction with amenities
55%	Response to work orders/trouble calls
39%	Satisfaction with projects/moves
20%	Satisfaction with building equipment

N = 125

UTILITIES

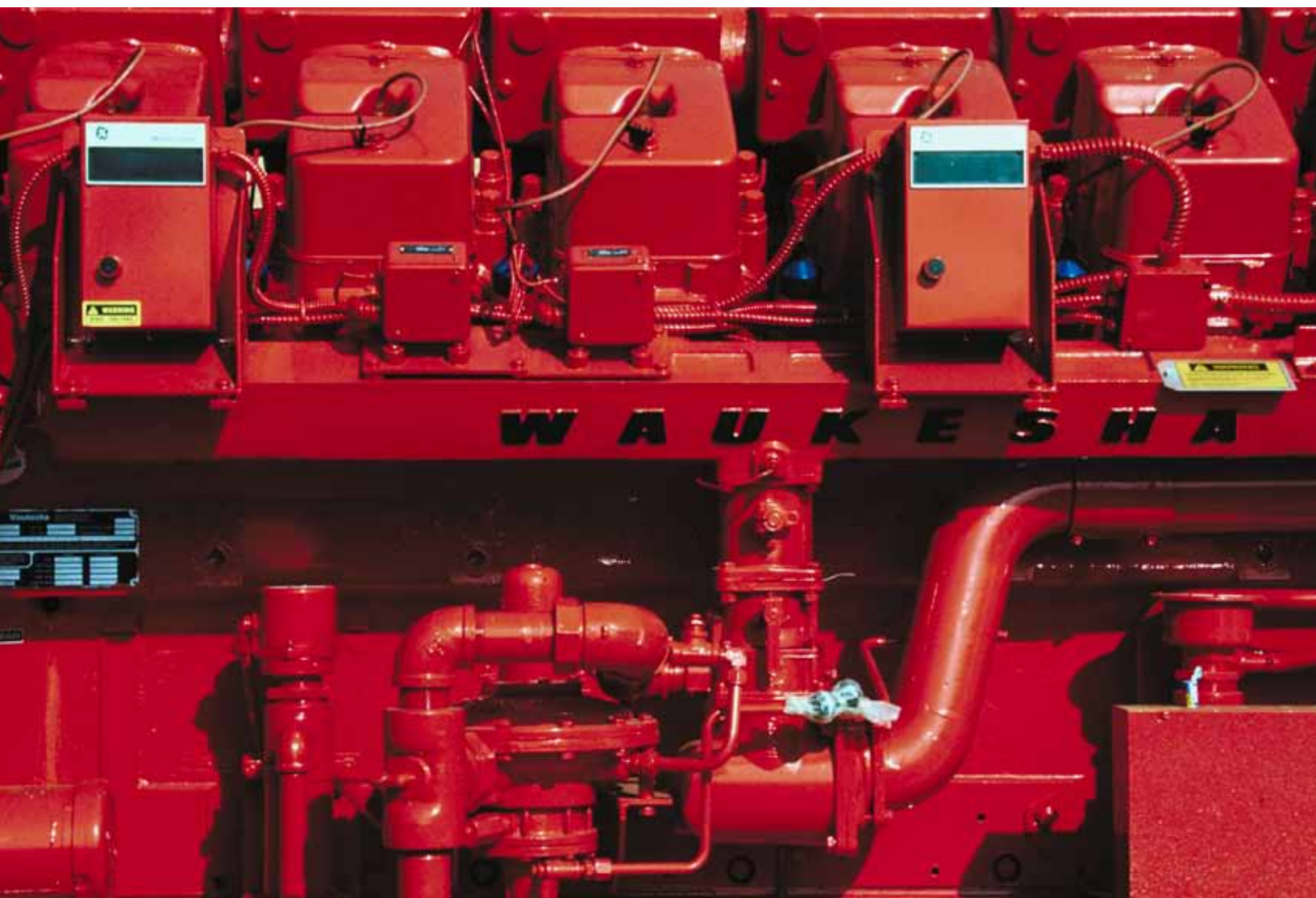
Utility Costs

Utility Consumption

Energy Use Index

Energy Management Practices

Building Automation System



Utilities

Utility Costs

Utility costs are associated with the provision of electrical power, potable water, central heating and cooling and sewage service. The utility categories provided were those most commonly used: electricity, fuel oil, natural gas, chilled water, steam, water and sewage. More than half of the respondents, 55%, reported sewage costs embedded in water costs, as they were unable to separate the two. The overall utility cost does not equal the sum of the separate utility costs because of different sample sizes. Here, utility costs are broken out by square footage and adjusted discharges.

Percentile	\$/GSF						
	Total Utilities	Electricity	Fuel Oil #2	Natural Gas	Steam	Water	Sewer
99	\$11.97	\$6.34	-----	\$4.33	-----	\$0.71	-----
95	\$10.81	\$5.23	\$0.93	\$2.46	-----	\$0.54	\$0.42
90	\$7.56	\$4.65	\$0.44	\$1.98	\$3.36	\$0.49	\$0.35
75	\$5.82	\$3.35	\$0.11	\$1.58	\$2.08	\$0.35	\$0.23
50	\$4.06	\$2.22	\$0.03	\$1.15	\$0.74	\$0.23	\$0.16
25	\$3.01	\$1.50	\$0.02	\$0.69	\$0.07	\$0.13	\$0.10
10	\$2.14	\$1.05	\$0.005	\$0.14	\$0.002	\$0.06	\$0.03
5	\$1.59	\$0.73	\$0.001	\$0.06	-----	\$0.04	\$0.004
1	\$0.31	\$0.27	----	\$0.01	-----	\$0.02	-----
Mean	\$4.61	\$2.49	\$0.12	\$1.18	\$1.22	\$0.25	\$0.18
N=	138	129	52	134	13	130	63

Percentile	\$/Discharge					
	Total Utilities	Electricity	Fuel Oil #2	Natural Gas	Water	Sewer
99	-----	-----	-----	-----	\$59.42	-----
95	\$520.14	\$550.48	\$30.94	\$149.17	\$37.54	\$33.87
90	\$367.96	\$247.21	\$13.43	\$117.80	\$25.13	\$22.25
75	\$248.21	\$162.38	\$3.59	\$66.61	\$13.35	\$10.92
50	\$140.17	\$88.72	\$0.70	\$40.61	\$7.36	\$6.36
25	\$91.89	\$55.72	\$0.33	\$23.39	\$4.39	\$3.41
10	\$60.49	\$27.01	\$0.21	\$4.52	\$2.93	\$1.02
5	\$41.24	\$14.32	\$0.05	\$1.27	\$1.70	\$0.06
1	\$2.72	\$1.65	\$0.04	\$0.86	\$0.07	-----
Mean	\$189.98	\$131.12	\$4.11	\$52.24	\$10.90	\$9.65
N=	95	97	37	96	94	53

Utility costs are affected by a variety of factors including climate, region, facility use and the presence of a central plant. These charts show the differences in utility costs for a variety of settings.

Central Plant	N	\$/GSF
Yes	104	\$4.94
No	34	\$3.58
Climate Zone	N	\$/GSF
US 1 (coldest)	20	\$4.12
US 2	32	\$4.00
US 3	20	\$4.42
US 4	43	\$4.93
US 5 (warmest)	17	\$4.53
CN 1 (coldest)	----	-----
CN 2	3	C\$3.30
CN 3	3	C\$3.56
CN 4 (warmest)	-----	-----
Country/Region	N	\$/GSF
Canada	6	C\$3.43
New England	19	\$5.33
Northeast	----	-----
Mid-Atlantic	8	\$3.11
Southeast	9	\$4.47
Midwest	15	\$4.11
North Central	17	\$3.48
Heartland	10	\$3.41
South Central	9	\$4.03
Mountain	9	\$3.30
Pacific	35	\$5.76
Age	N	\$/GSF
Less than 5 years	12	\$3.88
5 – 10 years	11	\$4.53
11 – 15 years	14	\$4.56
16 –20 years	10	\$4.95
21 –30 years	32	\$4.47
31 – 50 years	44	\$4.25
More than 50 years	13	\$4.66

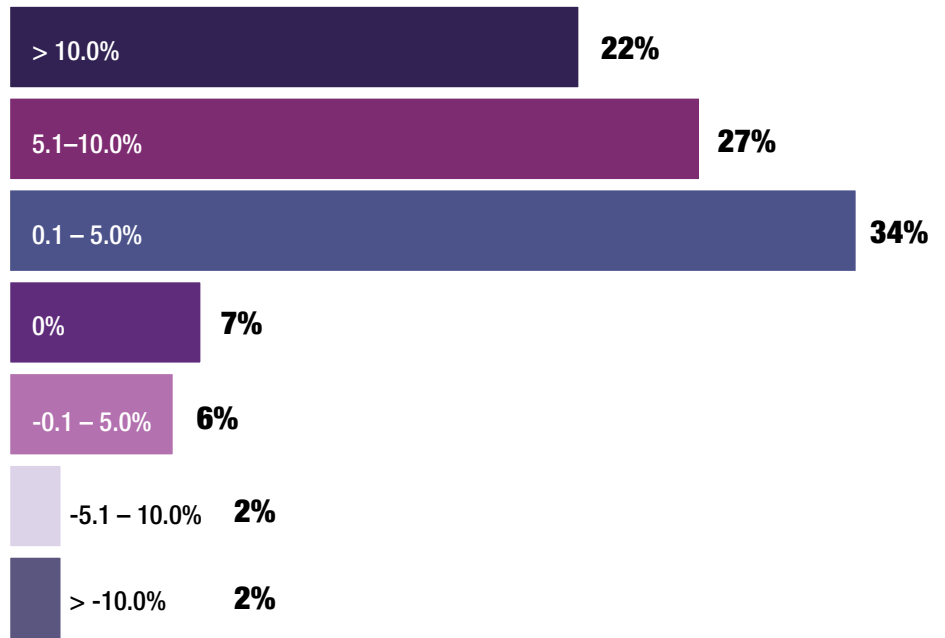
Facility Use	N	Total Utilities	\$/GSF					
			Electricity	Fuel Oil #2	Natural Gas	Steam	Water	Sewer
Acute Care	84	\$4.81	\$2.33	\$0.14	\$1.27	\$1.11	\$0.26	\$0.18
Critical Access	6	\$4.57	\$2.96	----	\$1.28	-----	\$0.27	\$0.11
Medical Center	28	\$4.46	\$2.31	\$0.10	\$0.95	\$1.26	\$0.21	\$0.19
Rehabilitation Center	7	\$3.44	\$1.82	----	\$1.00	-----	\$0.25	-----

Utilities

Utility Costs

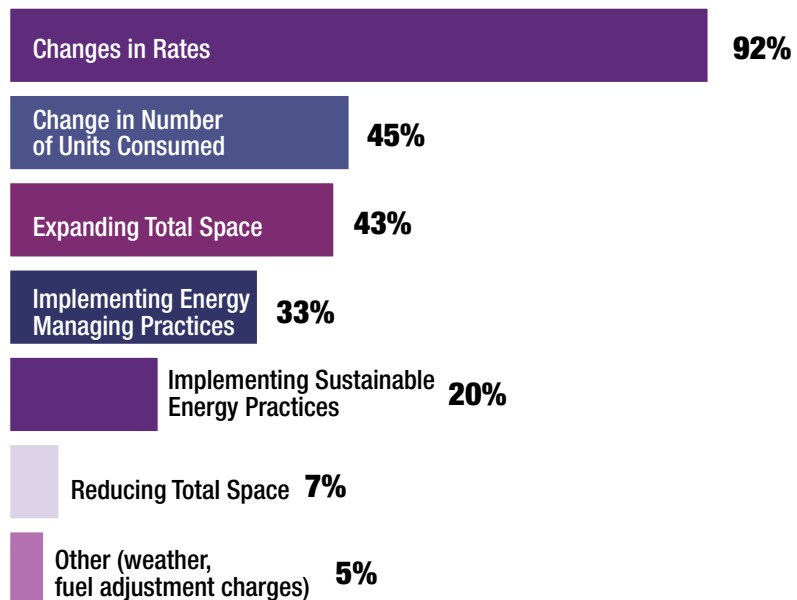
For 83% of the hospitals represented in this study, utility costs increased when compared to the previous year. For one out of five, the increase exceeded 10%. Many of the hospitals in this study are in a growth mode, so increases in utility costs are a result of expansion, but for most of the respondents, the rise in cost is due to higher utility rates.

Percentage Change in Utility Cost



N = 92

Utility Budget Impacted By



N = 113

Utility Consumption

The charts below capture consumption data for electricity, gas, fuel oil, water and sewage.

Percentile	Annual Consumption/GSF				
	Electricity kWh/GSF	Fuel Oil #2 Gallons/GSF	Natural Gas Therms/GSF	Water Gallons/GSF	Sewer Gallons/GSF
99	65	-----	5.11	-----	-----
95	56	0.370	2.96	110	108
90	47	0.21	2.04	97	86
75	34	0.02	1.69	74	58
50	28	0.01	1.27	50	37
25	21	0.003	0.68	28	9
10	20	0.002	0.06	2.42	0.34
5	3	-----	0.02	0.18	0.10
1	0.2	-----	0.002	0.08	0.03
Mean	28	0.05	1.27	51	39
N=	121	45	116	96	54

Percentile	Annual Consumption/Discharge				
	Electricity kWh	Fuel Oil #2 Gallons	Natural Gas Therms	Water Gallons	Sewer Gallons
99	8,527	-----	400	15,464	-----
95	5,638	35.34	236	8,184	4,703
90	2,345	15.81	132	4,687	3,909
75	1,564	3.33	65	3,065	2,272
50	1,029	0.36	43	1,976	1,679
25	722	0.11	24	982	439
10	363	0.03	3	289	44
5	134	0.01	2	47	6
1	29	-----	1	2	2
Mean	1,486	3.94	64	2,578	1,708
N=	94	36	94	79	42

Utilities

Energy Use Index

Consumption for electricity and gas can also be measured using an Energy Use Index (EUI.) To derive the EUI for electricity, kilowatt hours are multiplied by a conversion factor of 3.415 creating kBtus. The new number is divided by gross square footage. To calculate the EUI for natural gas, therms (100 CF) are multiplied by a factor of 100 and divided by gross square feet.

Percentile	Electricity kBtus/ GSF	Gas kBtus/ GSF
99	224	355
95	192	213
90	159	189
75	118	167
50	94	124
25	74	64
10	48	6
5	9	2
1	0.9	0.1
Mean	98	114
N =	121	112

Institution	N	Electricity kBtus/ GSF	Gas kBtus/ GSF
Acute Care	82	106	119
Critical Access	5	76	165
Medical Center	28	85	91
Climate Zones	N	Electricity kBtus/ GSF	Gas kBtus/ GSF
US 1 (coldest)	20	87	144
US 2	29	79	88
US 3	18	102	119
US 4	38	115	127
US 5 (warmest)	10	76	66

Energy Management Practices

Given the double digit increases in utility rates, maximizing energy efficiency is a priority within the healthcare sector. Here are some of the ways in which survey respondents have reduced their utility usage.

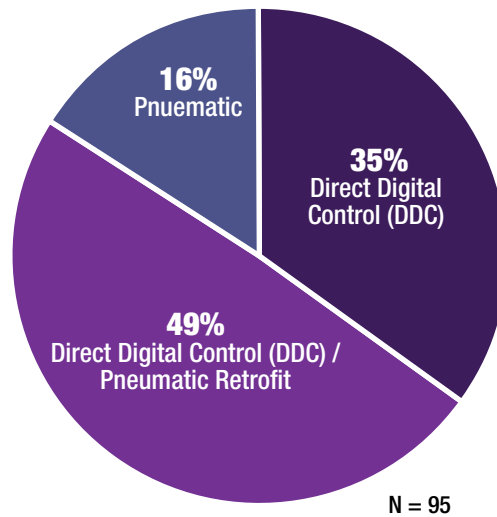
%	Utility Conservation Practices
43%	Replaced existing light fixtures with new lights
40%	Retrofitted existing light fixtures
34%	Installed energy-efficient motors
31%	Installed occupancy sensors
22%	Set back thermostat
20%	Installed energy management system
20%	Installed energy-efficient chillers
19%	Installed energy-efficient ventilation equipment
19%	Installed energy-efficient heating equipment
15%	Recommissioned building systems

N = 112

Facility Size (GSF)	N	BAS used
Less than 100,000	11	36%
100,001 – 200,000	13	62%
200,001 – 500,000	23	70%
500,001 – 1,000,000	39	90%
More than 1,000,000	31	94%
Overall	117	79%

Building Automation System

In this study, almost four out of five hospitals (79%) manage their utilities using a Building Automation System (BAS.) The majority are using Direct Digital Control (DDC) technology.



MAINTENANCE

Maintenance Categories

Maintenance Costs

Roads and Grounds

**Facility Operating Current
Replacement Value (CRV) Index**

Maintenance Tracking

Maintenance Staffing

Maintenance Workforce

Maintenance Management

Administrative Support

Total Maintenance

Maintenance Service Provision



Maintenance Categories

The survey divided maintenance cost into five distinct categories which are defined below.

EXTERNAL BUILDING MAINTENANCE

- Roof
- Skin (siding, masonry, sash, glazing, window washing, external doors)
- Exterior signage
- Parking structures (surface repairs, sealing, striping, lighting and drainage systems)
- Storm sewers (catch basins, manholes, sub-surface drainage systems)
- Underground fire systems and hydrants

INTERIOR SYSTEMS MAINTENANCE

- Electrical systems (primary and secondary systems, emergency electrical systems, UPS, lighting systems, egress signage, master clocks, fire/life safety systems and alarms and remote monitoring, elevator maintenance/repair)
- Mechanical systems (HVAC, chillers, boilers, plumbing, extinguishing systems, back flow prevention, refrigeration and non-process related pumps)
- Building and general maintenance (interior walls, doors, ceilings, partitions and interior finishes, pest control)
- Interior signage
- Administrative support services – trouble desks

UTILITY/CENTRAL SYSTEM MAINTENANCE

- Electrical (generation/distribution)
- Mechanical (steam, hot and cold water systems)

PROCESS TREATMENT AND ENVIRONMENTAL SYSTEMS

- Process cooling water systems
- Process gas systems
- Air discharge scrubbers
- Waste water systems
- Water treatment plants
- Incinerator operation
- Solid waste management system

ROADS AND GROUNDS MAINTENANCE

- Roadways, sidewalks, parking lots (paving repairs, sealing, striping, parking, roadway lighting, power washing), snow removal, de-icing
- Landscaping (planting, mowing, irrigation)

Maintenance

Maintenance Costs

Annual maintenance cost, also broken out by square footage and adjusted discharges, includes all repair, preventive, materials, direct labor and contract costs. Similar to the utility cost data, the costs listed in the “Total Maintenance” column do not equal the sum of the component costs due to the different sample sizes for each category.

		\$/GSF					
Percentile		Total Maintenance	External Building	Interior Systems	Roads and Grounds	Utility/Central System	Process Treatment and Environmental Systems
99	Best In Class	15.07	0.88	3.83	3.14	2.86	0.34
95		12.66	0.62	3.47	1.86	1.98	0.33
90		9.95	0.44	3.21	1.07	1.68	0.31
75		5.59	0.17	2.48	0.52	0.47	0.18
50		3.22	0.07	1.32	0.25	0.20	0.08
25		1.46	0.04	0.62	0.13	0.10	0.04
10		0.79	0.02	0.24	0.07	0.05	0.03
5		0.35	0.01	0.16	0.04	0.04	0.02
1		0.04	0.005	0.07	0.01	0.02	0.01
Mean			4.23	0.15	1.57	0.45	0.48
N =		116	85	87	122	47	31

		\$/Discharge					
Percentile		Total Maintenance	External Building	Interior Systems	Roads and Grounds	Utility/Central System	Process Treatment and Environmental Systems
99	Best In Class	449.04	61.11	341.36	104.72	160.79	48.50
95		419.74	51.21	300.89	77.03	133.65	44.43
90		388.86	28.55	261.44	60.16	95.83	34.92
75		303.51	9.72	139.43	29.23	41.30	11.31
50		137.70	4.40	50.02	13.25	12.27	4.38
25		46.73	1.06	16.04	5.55	3.34	1.94
10		23.28	0.44	11.13	2.77	1.08	1.01
5		13.26	0.18	6.86	1.36	0.51	.029
1		0.27	0.01	0.10	0.04	0.10	0.02
Mean			172.87	9.07	89.70	21.83	27.68
N =		83	56	58	91	33	25

Maintenance Costs

\$/GSF							
Institution	N	Total Maintenance	External Building	Interior Systems	Roads and Grounds	Utility/Central System	Process Treatment and Environmental Systems
Acute Care	71	\$4.65	\$0.12	\$1.62	\$0.54	\$0.71	\$0.13
Critical Access	5	\$2.90	\$0.05	\$2.40	\$0.42	---	----
Medical Center	29	\$4.02	\$0.24	\$1.93	\$0.31	\$0.68	\$0.26
Rehabilitation Center	6	\$1.60	\$0.24	\$1.27	\$0.14	----	----

Region	N	\$/GSF
Canada	5	C\$3.42
New England	18	\$2.87
Northeast	----	----
Mid-Atlantic	7	\$1.60
Southeast	7	\$2.85
Midwest	12	\$2.92
North Central	16	\$2.52
Heartland	7	\$2.01
South Central	9	\$3.50
Mountain	9	\$3.43
Pacific	30	\$10.02

Age of Facility	N	\$/GSF	% Preventive Maintenance	% Repair/Breakdown Maintenance
Less than 5 years	11	\$4.60	63%	37%
5 – 10	10	\$3.84	54%	46%
11 – 15	10	\$4.52	51%	49%
16 – 20	8	\$6.11	48%	52%
21 – 30	31	\$4.28	46%	54%
31 – 50	36	\$4.84	42%	58%
51 – 100	11	\$4.83	42%	58%

Maintenance

Roads and Grounds

The maintenance of roads, grounds, parking surfaces and structures are also represented as dollar per developed acre. Snow or lack thereof, impacts the cost of maintaining roads and grounds as demonstrated by the climate zone chart.

Percentile	\$/Developed Acre
99	\$45,670
95	\$34,408
90	\$25,867
75	\$11,671
50	\$5,802
25	\$3,065
10	\$1,518
5	\$953
1	\$157
Mean	\$9,624

N = 114

Institution	N	\$/Developed Acre
Acute care	73	\$6,567
Critical access	4	\$2,830
Medical center	27	\$5,835
Rehabilitation center	6	\$3,462
Facility Use	N	\$/Developed Acre
Single building	60	\$5,432
Multiple buildings, one location	37	\$6,204
Multiple buildings, multiple sites	17	\$6,110
Facility Setting	N	\$/Developed Acre
Central business district	15	\$10,216
Secondary downtown location	41	\$6,896
Suburban area	44	\$5,221
Rural area	10	\$2,886
Climate Zone	N	\$/Developed Acre
US 1 (coldest)	20	\$8,473
US 2	27	\$8,841
US 3	15	\$5,000
US 4	38	\$7,241
US 5 (warmest)	10	\$4,824
CN 1 (coldest)	---	-----
CN 2	---	-----
CN 3	3	\$6,408
CN 4 (warmest)	----	-----

Maintenance

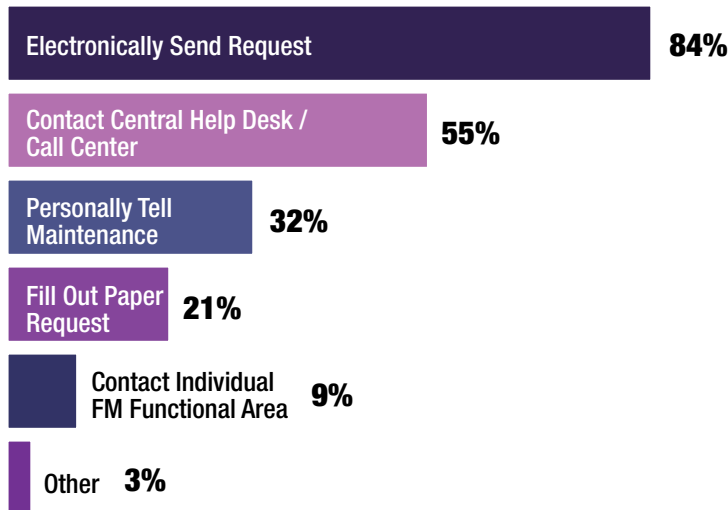
Facility Operating Current Replacement Value (CRV) Index

The CRV index represents the level of funding provided for maintaining an organization's portfolio of capital assets. This percentage is derived by dividing total annual maintenance by current replacement value and multiplying by 100. The 1990 National Research Council report *Committing to the Cost of Ownership: The Maintenance and Repair of Public Buildings* recommends a budget allocation for routine maintenance and repair to be in the 2% to 4% range of aggregate current replacement value.

Percentile	CRV Index %
99	5.08%
95	3.30%
90	3.01%
75	2.09%
50	1.28%
25	0.67%
10	0.24%
5	0.14%
1	0.03%
Mean	1.48%

N = 90

How do Customers Request Work



N = 117

Maintenance Tracking

Maintenance

Maintenance Management System Used

Facility Size (GSF)	N	CAFM with maintenance module	CMMS	Manual Spreadsheets	Other
Less than 100,000	10	20%	20%	30%	30%
100,001 – 200,000	13	0%	70%	15%	15%
200,001 – 500,000	23	13%	87%	0%	0%
500,001 – 1,000,000	39	0%	95%	0%	5%
More than 1,000,000	31	6%	87%	3%	3%
Overall	116	6%	82%	5%	7%

Maintenance Productivity Data Collected	Percentage
Response time for work requests	60%
Percentage of work orders closed on time	60%
Cost per square foot	58%
Number of service complaints	52%
Maintenance staffing per square foot	32%
Percentage of budget spent on breakdown maintenance	29%

N = 581

Maintenance Staffing

Respondents were asked to complete a detailed worksheet indicating the number of workers employed or contracted in their respective hospital operation. The worksheet was split into three categories: maintenance workforce (trades), maintenance management and administrative support. Custodial workers and grounds keeping staff were not included in this maintenance headcount. The data provided shows the number of FTEs based upon facility size, provision of labor, and number of shifts and days worked and ratio of space per position. Variation swings may be explained by cross training of different trades.

Electricians Staffing ratio – 1 per 213,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	10	1.83	50%	50%	1	5.0
250,001 – 500,000	9	2.27	50%	50%	1	5.0
500,001- 750,000	17	4.11	50%	50%	1	5.0
750,001- 1,000,000	13	4.78	50%	50%	1	5.0
1,000,001 – 2,000,000	19	7.52	50%	50%	1	5.0
More than 3,000,000	11	16.00	50%	50%	1.5	5.0

Plumbers Staffing ratio – 1 per 484,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	8	0.72	87%	13%	1	5.0
250,001 – 500,000	7	0.83	57%	43%	1	5.0
500,001- 750,000	16	1.28	93%	7%	1	5.0
750,001- 1,000,000	13	2.15	88%	12%	1	5.0
1,000,001 – 2,000,000	16	2.59	100%	0%	1	5.0
More than 3,000,000	11	5.00	100%	0%	1.4	5.0

Controls and Low Voltage Staffing ratio – 1 per 600,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	5	0.55	80%	20%	1	3.5
250,001 – 500,000	5	0.91	76%	24%	1	5.0
500,001- 750,000	6	1.15	66%	34%	1	5.0
750,001- 1,000,000	11	1.61	79%	21%	1	5.0
1,000,001 – 2,000,000	9	1.84	66%	34%	1	5.0
More than 3,000,000	7	4.45	100%	0%	1.3	5.3

HVAC and Central Plant Operators Staffing ratio – 1 per 283,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	9	1.04	100%	0%	1.6	5.0
250,001 – 500,000	10	1.92	68%	32%	3	5.0
500,001- 750,000	18	2.41	100%	0%	3	5.3
750,001- 1,000,000	12	3.33	100%	0%	3	5.5
1,000,001 – 2,000,000	18	4.52	96%	4%	3	5.5
More than 3,000,000	11	9.00	100%	0%	3	5.5

Maintenance

Maintenance Staffing

Stationery Engineers Staffing ratio – 1 per 170,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	12	2.40	91%	9%	1	6.0
250,001 – 500,000	12	3.77	100%	0%	1	6.0
500,001- 750,000	21	4.93	100%	0%	1	7.0
750,001- 1,000,000	8	5.50	100%	0%	1	7.0
1,000,001 – 2,000,000	16	6.56	96%	4%	1	7.0
More than 3,000,000	11	14.68	100%	0%	1	7.0

Carpenters Staffing ratio – 1 per 496,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	11	0.84	100%	0%	1	4.4
250,001 – 500,000	8	1.05	75%	25%	1	5.0
500,001- 750,000	16	1.59	91%	9%	1	5.0
750,001- 1,000,000	13	2.63	100%	0%	1	5.0
1,000,001 – 2,000,000	17	3.23	100%	0%	1	5.0
More than 3,000,000	10	6.88	99%	1%	1	5.2

Generalists Staffing ratio – 1 per 124,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	24	2.15	98%	2%	1.0	5.0
250,001 – 500,000	14	4.37	99%	1%	1.5	5.3
500,001- 750,000	22	5.21	100%	0%	1.3	5.3
750,001- 1,000,000	12	8.16	100%	0%	2.0	6.0
1,000,001 – 2,000,000	18	9.46	99%	1%	2.0	6.0
More than 3,000,000	10	15.40	98%	2%	2.0	6.0

Locksmiths Staffing ratio – 1 per 1,060,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	6	0.25	100%	0%	1	3.5
250,001 – 500,000	7	0.45	100%	0%	1	5.0
500,001- 750,000	8	0.75	100%	0%	1	5.0
750,001- 1,000,000	6	1.16	100%	0%	1	5.0
1,000,001 – 2,000,000	12	1.44	91%	9%	1	5.0
More than 3,000,000	9	1.60	100%	0%	1	5.0

Maintenance Staffing

Painters Staffing ratio – 1 per 397,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	Number of shifts per day	Number days per week
Less than 250,000	14	0.85	78%	22%	1	5.0
250,001 – 500,000	11	1.10	81%	19%	1	5.0
500,001- 750,000	19	1.78	85%	15%	1	5.0
750,001- 1,000,000	12	2.17	86%	14%	1	5.0
1,000,001 – 2,000,000	18	3.27	100%	0%	1	5.0
More than 3,000,000	11	5.40	99%	1%	1	5.2

Maintenance Management

Group Supervisor Staffing ratio– 1 per 448,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	% Exempt (Salaried)	% Non-exempt (Hourly)
Less than 250,000	9	0.97	94%	6%	50%	50%
250,001 – 500,000	11	1.00	90%	10%	50%	50%
500,001- 750,000	17	1.26	100%	0%	50%	50%
750,001- 1,000,000	13	1.92	96%	4%	92%	8%
1,000,001 – 2,000,000	15	3.20	97%	3%	73%	26%
More than 3,000,000	11	5.81	100%	0%	50%	50%

Operations and Maintenance Manager Staffing ratio – 1 per 485,000 GSF						
Facility Size (GSF)	N	Number of FTEs	% In-house	% Contract	% Exempt (Salaried)	% Non-exempt (Hourly)
Less than 250,000	23	1.00	91%	9%	90%	10%
250,001 – 500,000	17	1.00	88%	12%	88%	12%
500,001- 750,000	21	1.23	95%	5%	90%	10%
750,001- 1,000,000	14	1.50	93%	7%	100%	0%
1,000,001 – 2,000,000	17	1.58	94%	6%	93%	7%
More than 3,000,000	11	3.00	97%	3%	90%	10%

Maintenance

Administrative Support

Help Desk Staffing ratio – 1 per 587,000 GSF		
Facility Size (GSF)	N	Number of FTEs
Less than 250,000	14	0.85
250,001 – 500,000	11	1.10
500,001- 750,000	19	1.78
750,001- 1,000,000	12	2.17
1,000,001 – 2,000,000	18	3.27
More than 3,000,000	11	5.40

Administrative Assistant Staffing ratio – 1 per 600,000 GSF		
Facility Size (GSF)	N	Number of FTEs
Less than 250,000	4	0.93
250,001 – 500,000	5	0.96
500,001- 750,000	5	1.19
750,001- 1,000,000	9	1.30
1,000,001 – 2,000,000	9	1.44
More than 3,000,000	6	3.00

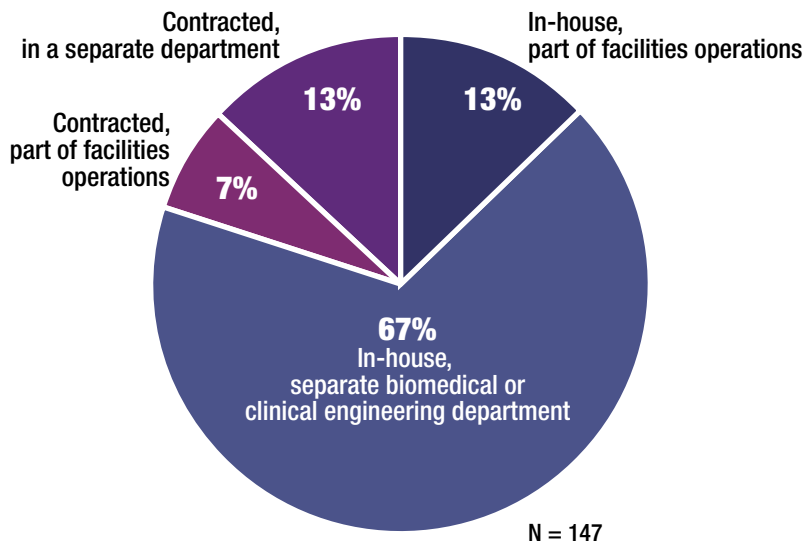
Total Maintenance

In a 2009 IFMA study, the ratio of maintenance FTEs to space is one to 49,000 square feet. However, for this study, the overall ratio is one maintenance FTE per 31,000 square feet. Keeping in mind the complexity of hospital operations and the continuous hours of operations, it makes sense that the ratio reflects a higher level of staffing.

Total Maintenance Staff Staffing ratio – 1 per 31,000 GSF		
Facility Size (RSF)	N	Number of FTEs
Less than 250,000	38	8.15
250,001 – 500,000	25	15.10
500,001- 750,000	25	20.86
750,001- 1,000,000	15	29.14
1,000,001 – 2,000,000	19	39.52
More than 3,000,000	12	71.10

Institution	N	Total Maintenance Staff
Acute Care	87	22.75
Critical Access	6	7.58
Medical Center	30	34.08
Rehabilitation Center	7	8.25

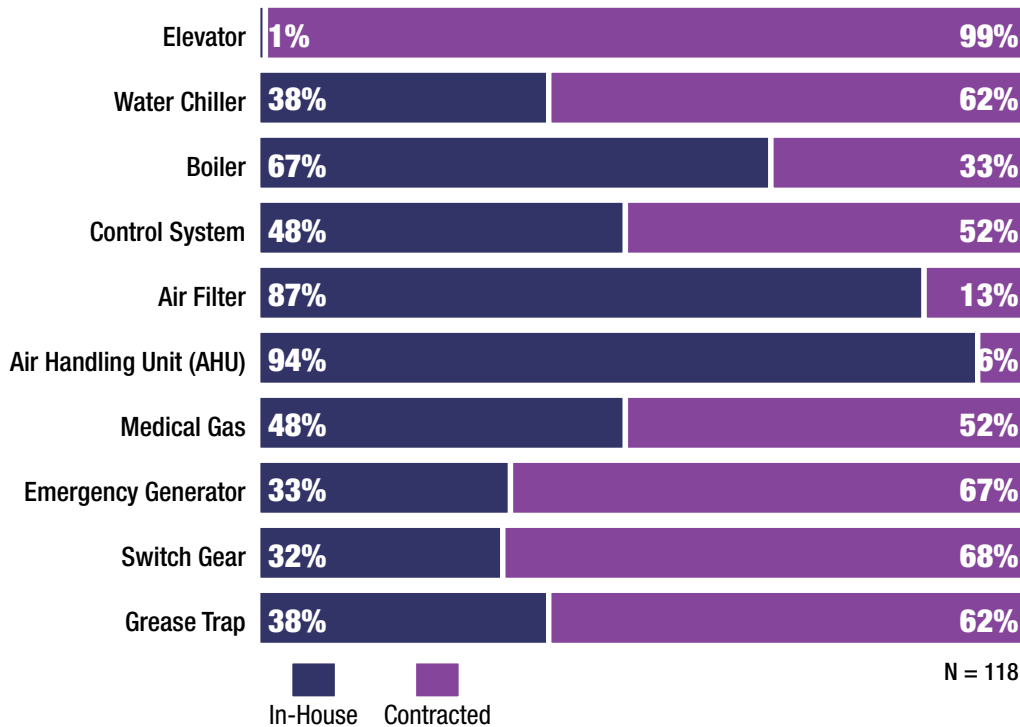
Medical Equipment Management Performed By



Service Provision

The majority of the study respondents, 65%, rely on a separate department such as biomedical or clinical engineering to handle maintenance for medical equipment.

Scheduled Maintenance

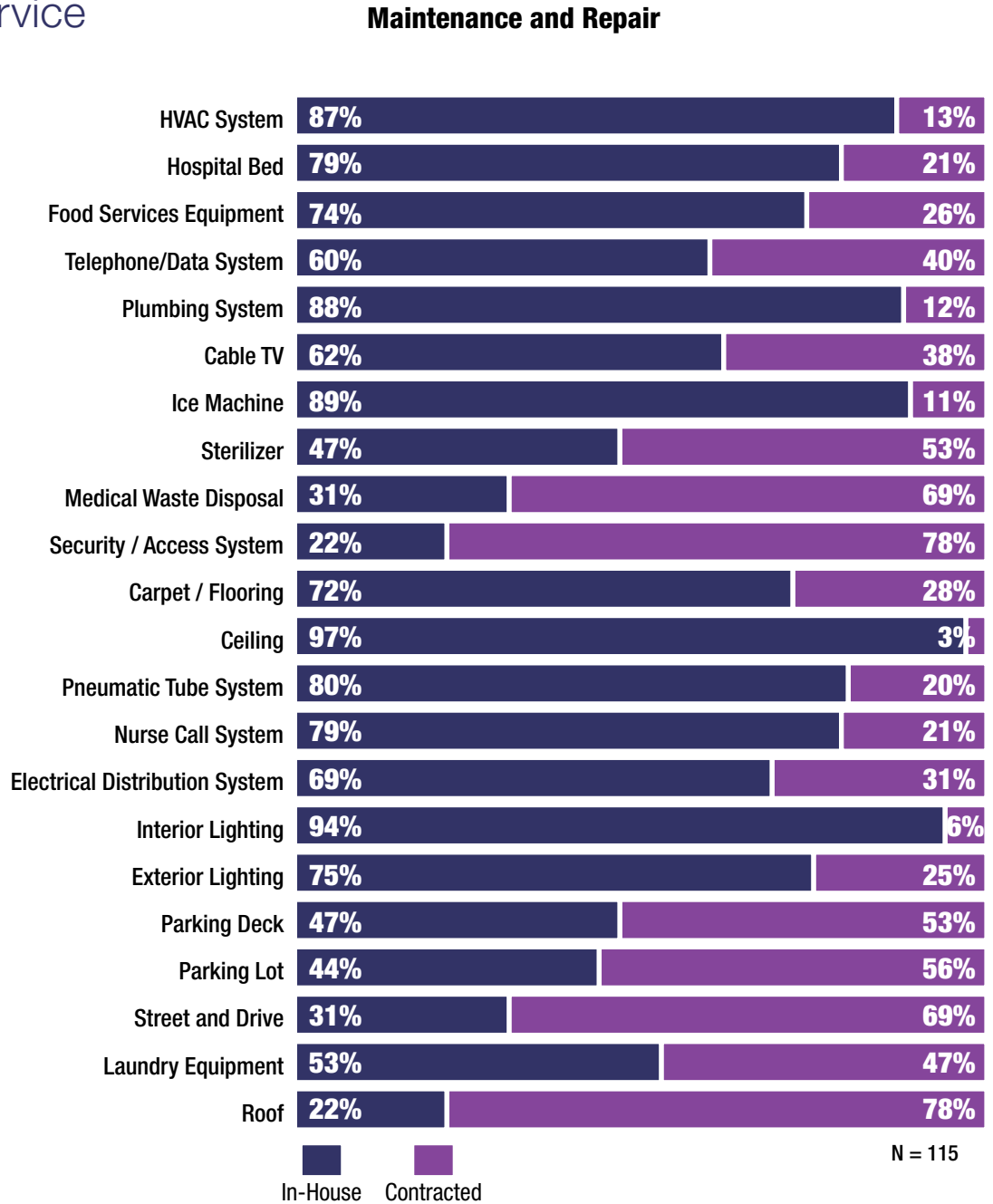


Maintenance Service Provision

The following charts provide a breakdown of how maintenance tasks are handled, either with in-house or contracted labor.

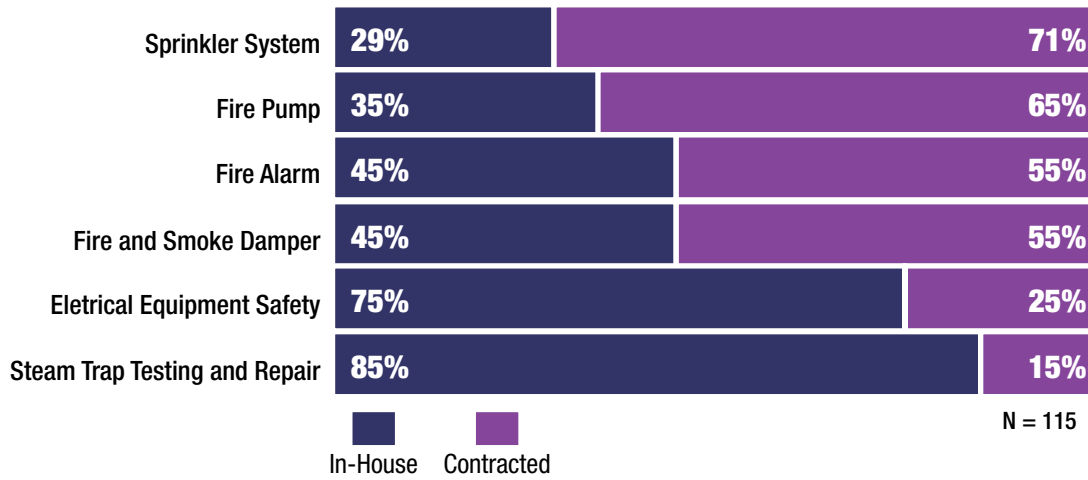
Maintenance

Maintenance Service Provision



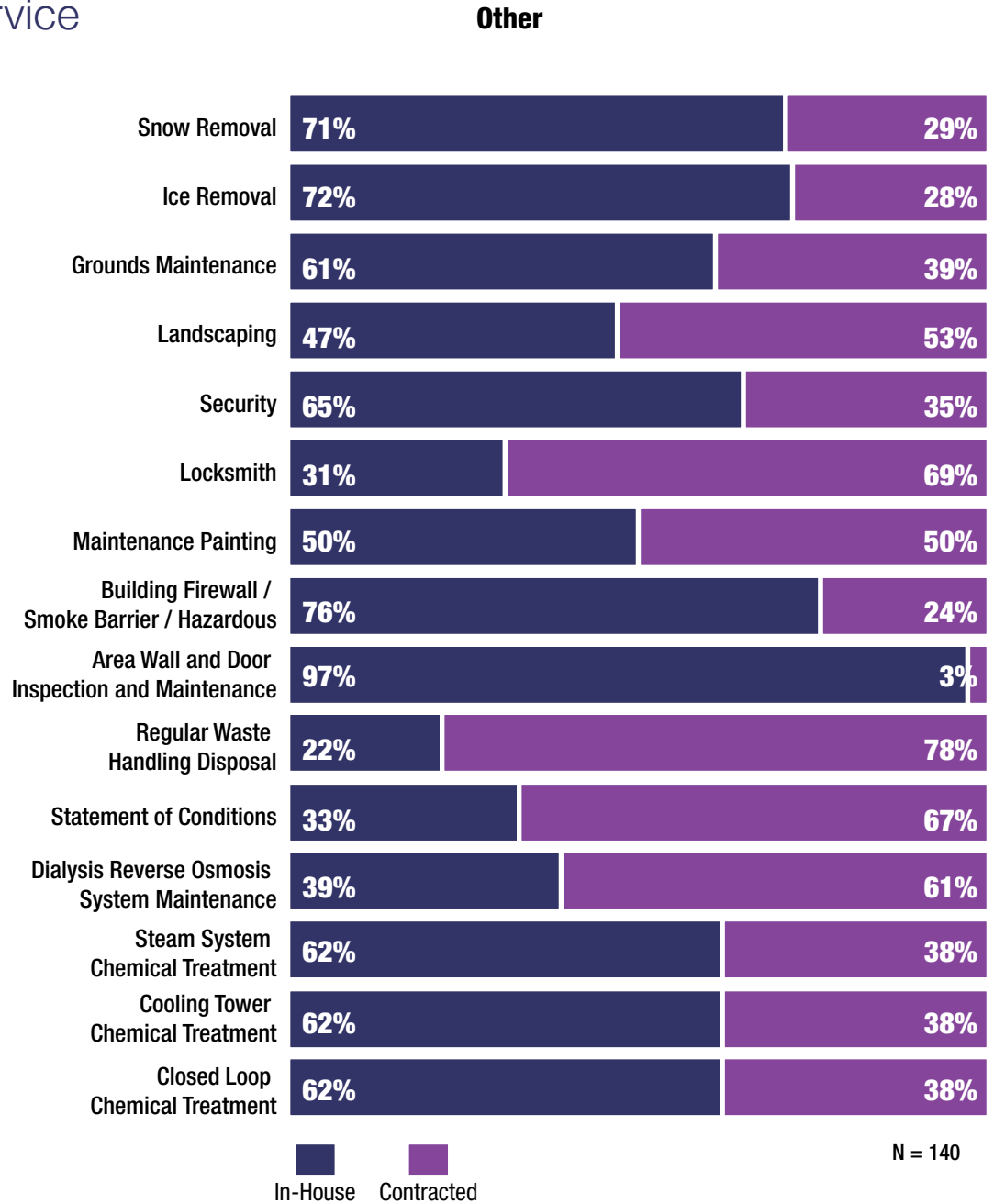
Testing

Maintenance Service Provision



Maintenance

Maintenance Service Provision



ENVIRONMENTAL SERVICES

Environmental Services Costs
Environmental Services Staffing
Contractor Practices



Environmental Services

Environmental Services Costs

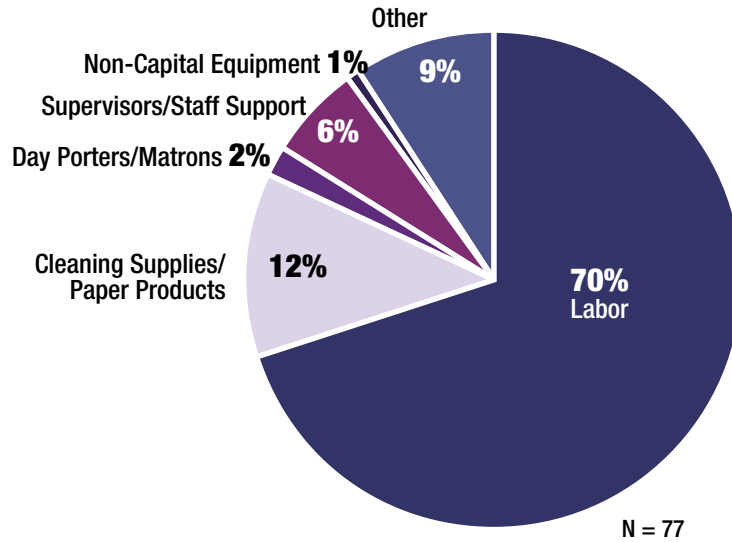
Environmental services costs are the costs associated with the cleaning of patient rooms, offices and work areas, restrooms and common support space. Also included in this cost are wages, benefits, staff support, supervision, administration, supplies, paper goods and non-capital equipment. Labor is the major component of the cost, therefore any change in wages can affect the overall cost significantly.

Percentile	\$/GSF	\$/Discharge
99	\$42.69	----
95	\$32.17	\$721
90	\$23.67	\$647
75	\$8.11	\$425
50	\$4.41	\$190
25	\$2.68	\$101
10	\$2.02	\$74
5	\$1.67	\$54
1	\$0.02	-----
Mean	\$8.14	\$282
N	108	88

Environmental Services Function Performed By:	N	\$/GSF	\$/Discharge
In-house staff	91	\$7.00	\$281
Contracted service	5	\$4.23	\$299
Institution	N	\$/GSF	\$/Discharge
Acute Care	69	\$8.59	\$302
Critical Access	3	\$4.20	\$153
Medical Center	25	\$4.03	\$251
Age	N	\$/GSF	\$/Discharge
Less than 5 years	11	\$3.80	\$359
5 – 10 years	11	\$4.03	\$288
11 – 15 years	7	\$5.79	\$377
16 – 20 years	8	\$2.48	\$334
21 – 30 years	22	\$4.88	\$239
31 – 50 years	31	\$4.52	\$287
More than 50 years	12	\$3.70	\$215
Region	N	\$/GSF	\$/Discharge
Canada	5	C\$5.45	-----
New England	11	\$4.30	\$222
Northeast	----	-----	-----
Mid-Atlantic	6	\$2.76	\$280
Southeast	5	\$3.36	\$73
Midwest	12	\$3.46	\$109
North Central	15	\$3.95	\$111
Heartland	6	\$3.17	\$154
South Central	5	\$2.98	\$252
Mountain	6	\$3.62	\$143
Pacific	31	\$14.45	\$453

Environmental Services

Environmental Services Costs

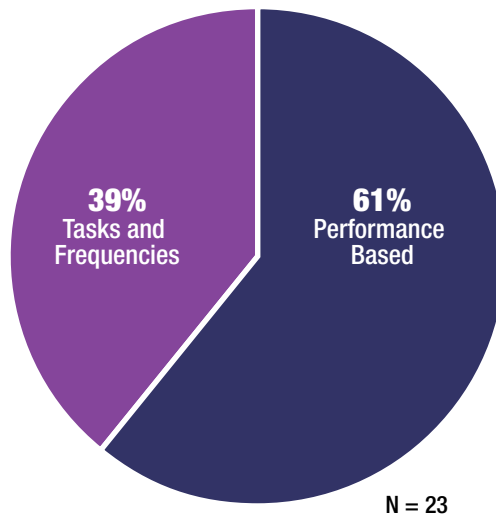


Facility Size (GSF)	N	Number of Environmental Services FTEs	Number of In-House Employees Supervising Contract
Less than 250,000	34	24.5	0.8
250,001 – 500,000	16	37.5	1.0
500,001- 750,000	16	61.0	1.1
750,001- 1,000,000	11	94.3	1.5
1,000,001 – 2,000,000	13	111.9	1.8
More than 3,000,000	9	173.7	2.0

Environmental Services Staffing

Ninety-five percent of the institutions represented in this study hire predominantly in-house employees to staff the environmental services function. The balance, 5%, use contracted staff to perform this function.

Terms of Contract

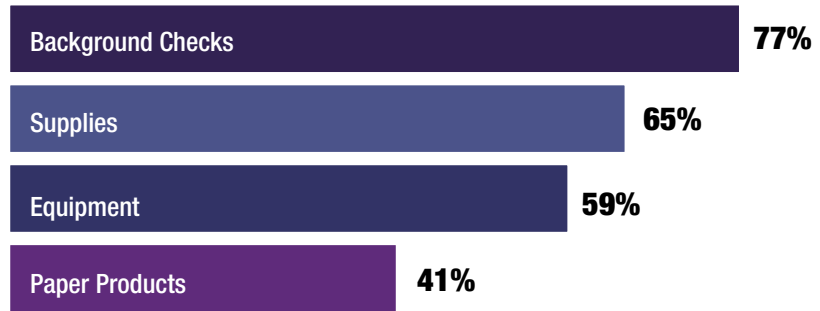


Contractor Practices

Environmental Services

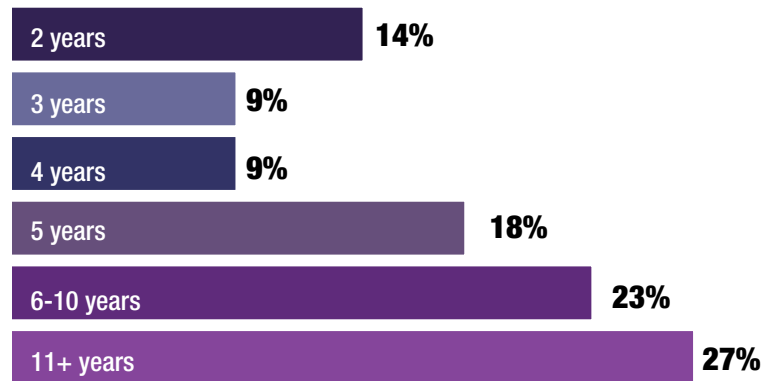
Contractor Practices

Contractor Provides



N = 23

Number of Years Contractor Has Been in Place



N = 22

WASTE

Waste Utilization



Waste

Waste Utilization

Waste management has become increasingly important, as waste is often viewed as a measurement of overall business performance. The ability to manage and reduce waste impacts the bottom line.

Percentile		\$/LBS					Recyclables (Co-Mingled)
		Solid Waste	Infectious Waste	Hazardous Waste (Non-Pharmaceutical)	Hazardous Waste (Pharmaceutical)	Chemo Waste	
99	Best In Class	\$136.85	\$16.67	\$26.47	\$12.50	\$4.68	\$10.82
95		\$86.94	\$1.03	\$24.70	\$12.02	\$4.67	\$7.64
90		\$11.48	\$0.73	\$17.11	\$11.61	\$4.63	\$0.20
75		\$0.09	\$0.49	\$4.85	\$4.66	\$0.99	\$0.08
50		\$0.05	\$0.29	\$2.76	\$2.90	\$0.45	\$0.05
25		\$0.03	\$0.21	\$0.78	\$0.80	\$0.27	\$0.02
10		\$0.02	\$0.17	\$0.38	\$0.23	\$0.25	\$0.01
5		\$0.01	\$0.16	\$0.08	\$0.13	\$0.24	-\$0.005
1		\$0.004	\$0.06	\$0.01	-----	-----	-\$0.01
Mean			\$0.14	\$0.36	\$4.51	\$2.84	\$1.11
N=		47	42	25	11	13	25

Percentile		\$/Discharge				Recyclables (Co-Mingled)
		Solid Waste	Infectious Waste	Hazardous Waste (Non-Pharmaceutical)	Chemo Waste	
99		\$46.44	\$26.89	\$8.45	\$11.52	\$13.26
95		\$30.58	\$20.85	\$8.24	\$7.53	\$12.45
90		\$24.88	\$13.63	\$7.49	\$4.77	\$9.34
75		\$10.60	\$5.40	\$2.84	\$0.70	\$2.58
50		\$4.00	\$2.67	\$1.11	\$0.13	\$0.73
25		\$2.14	\$1.20	\$0.23	\$0.05	\$0.17
10		\$1.27	\$0.64	\$0.07	\$0.02	\$0.06
5		\$0.87	\$0.17	\$0.06	\$0.01	\$0.02
1		\$0.03	\$0.01	\$0.05	-----	\$0.01
Mean		\$8.37	\$4.81	\$2.06	\$1.09	\$2.37
N=		54	46	24	16	29

LINEN SERVICES

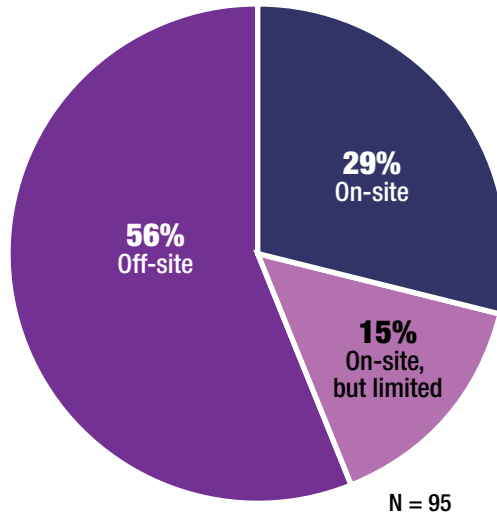


Linen Services

Linen Services

More than half of the participating institutions, 56%, send linens off-site for laundering.

Linen Processed



The charts to the right show annual linen processing cost by pounds and by adjusted discharges.

Percentile	\$/LBS	\$/Discharge
99	\$2.14	\$220
95	\$0.73	\$174
90	\$0.63	\$106
75	\$0.51	\$61
50	\$0.43	\$38
25	\$0.32	\$23
10	\$0.27	\$13
5	\$0.08	\$5
1	\$0.01	\$1
Mean	\$0.45	\$51

N = 50

Industry	N	\$/LBS	\$/Discharge
Acute Care	32	\$0.44	\$51
Medical Center	17	\$0.41	\$48

COST OF OPERATIONS

Cost of Facility Operations



Cost of Operations

Cost of Facility Operations

Combining the utility, maintenance and environmental services costs together will provide a facility's cost of operations, another indicator of performance. These annual costs are broken out by square footage, adjusted discharges and FTEs.

Percentile	\$/GSF	\$/Discharge	\$/FTE
99	\$64.52	\$2,307	\$6,912
95	\$49.65	\$1,544	\$6,547
90	\$37.77	\$1,300	\$6,349
75	\$18.85	\$1,062	\$4,856
50	\$13.08	\$599	\$4,139
25	\$8.62	\$297	\$3,425
10	\$6.04	\$219	\$3,064
5	\$5.10	\$167	\$2,229
1	\$1.53	\$4	\$1,877
Mean	\$17.32	\$706	\$4,317
N =	92	79	55

Institution	N	\$/GSF	\$/Discharge	\$/FTE
Acute Care	64	\$14.76	\$756	\$4,546
Medical Center	22	\$12.58	\$909	\$4,562



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