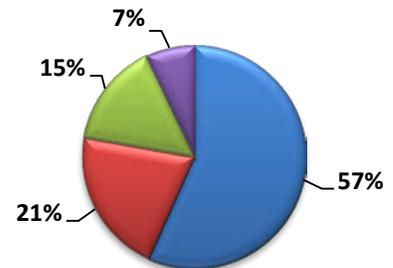




Facilities Management Maintenance and Operations provides resources required to support the daily operations of campus programs. This information presented presents an overview of operations with comparative analysis to similar sized peer universities in the region. The peer comparison is based on an APPA facility performance indicator survey performed in 2012. The Survey participants are confidential; however the selected peers are of comparable size and region. Facilities Management Maintenance and Operations is involved in the management of 1,4,833,807 gross square feet which is detailed by location below:

■ Main Campus Operations	2,713,108 GSF
■ Main Campus Housing	1,011,144 GSF
■ College of Health Sciences	722,911 GSF
■ Off-Site Campuses/Locations	<u>339,253 GSF</u>
TOTAL:	<u>4,833,807 GSF</u>



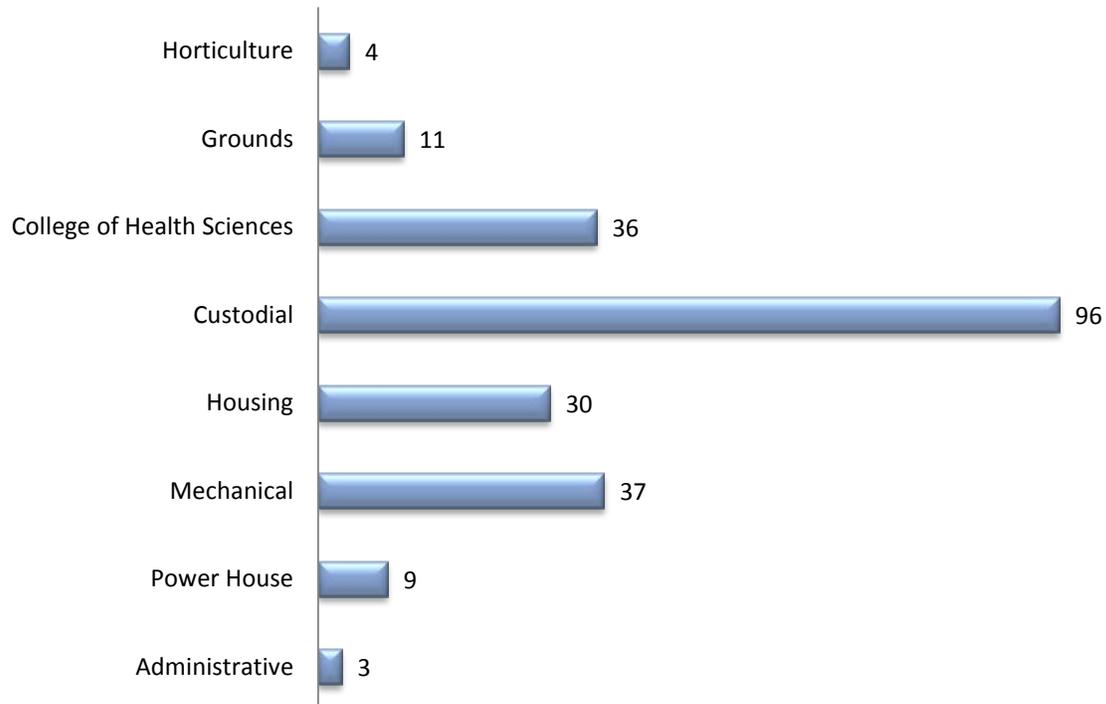
Facilities Management Maintenance and Operations can be broken into 9 key divisions within operations.

- Power House & Utility Distribution Systems
- Custodial & Event Crews
- Energy Management & Electrical
- Fleet Operations & Transportation
- Mechanical (Plumbing, HVAC)
- Grounds & Horticulture
- Housing Facilities
- Customer Service & Work Order Operation
- College of Health Sciences & Clinic Support

Operational effectiveness, efficiency, customer service, and valued consumer services are part of the manager’s annual performance rating. For example, over the past years gross square footage for ETSU has increased on not only main campus, but through clinic and medical residency operations. The increased square footage normally translates into additional staff, however the opposite has occurred. Approximately 1,478,368 square feet were added to campus operations and an additional 1,32,158 square feet transferred from Housing to main campus maintenance operations; i.e. Ross Hall.



FY 13/14 - 3226 Total FTE's by Department as of 04/23/2014



Reduction in staffing positions is only one component to increased effectiveness; budget reductions follow. In 2013 operational budgets were reduced based on student FTE enrollment. Processes were established to monitor/justify expenditures. It was imperative that division managers implement program changes to reduce the total cost of ownership.

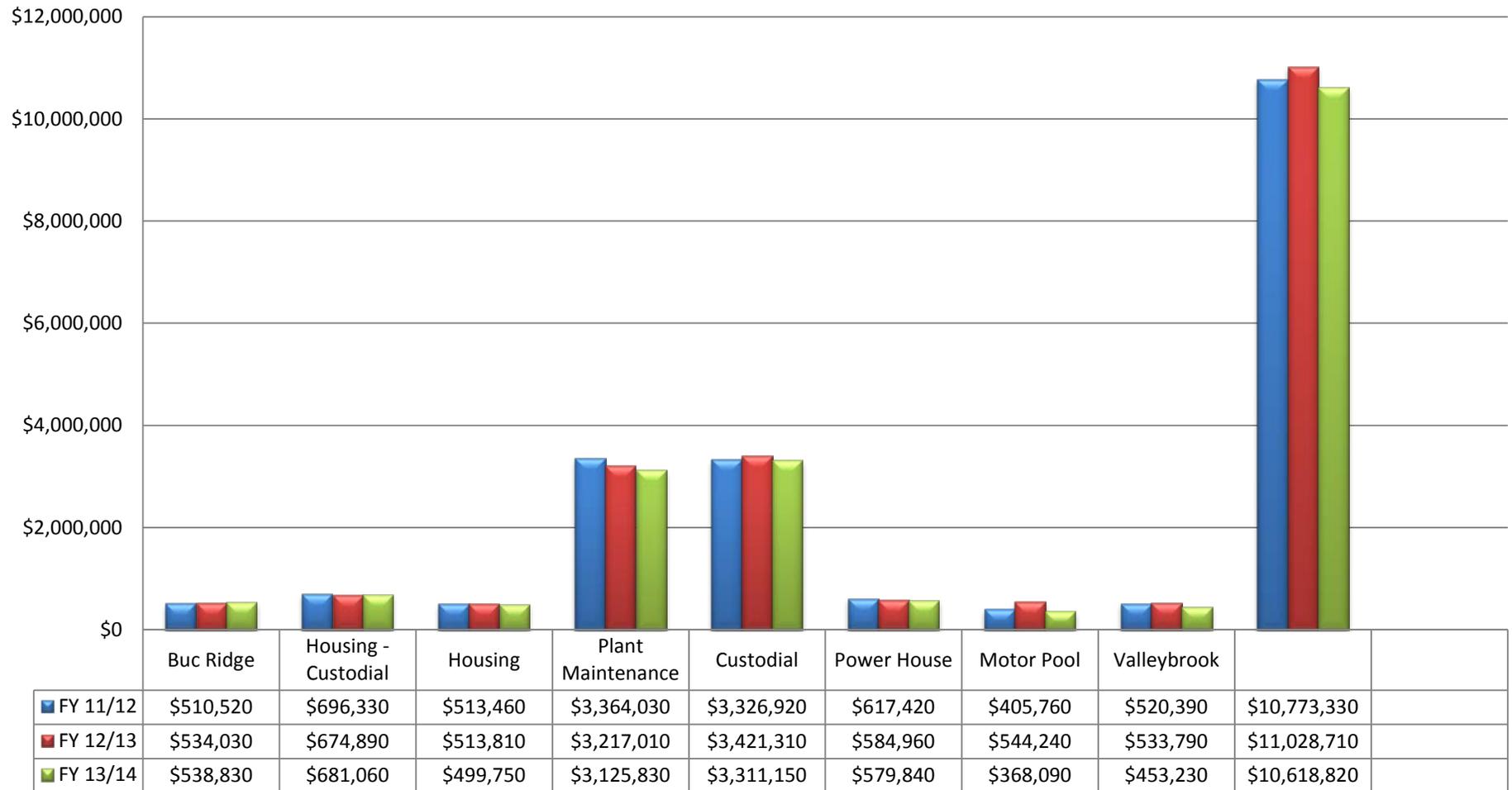
The processes have worked with year end balances ending on a positive note.

Program changes adopted included:

1. Implementation of vacancy and turnover to reduce labor cost.
2. Increase energy conservation measures; reduced building temperatures as well as capitalizing on load shed opportunities.
3. Managers use of high/low scenario for prioritization, value, and customer service.

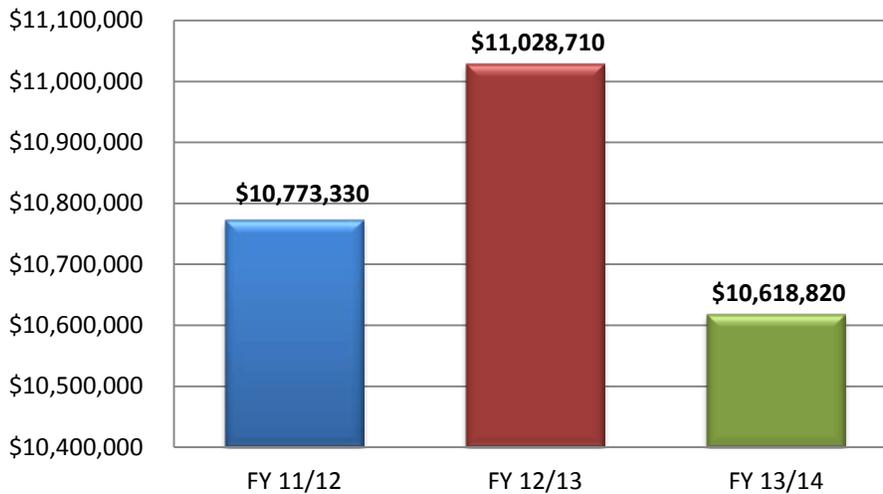


Maintenance & Operation Budget FY Comparison by Department



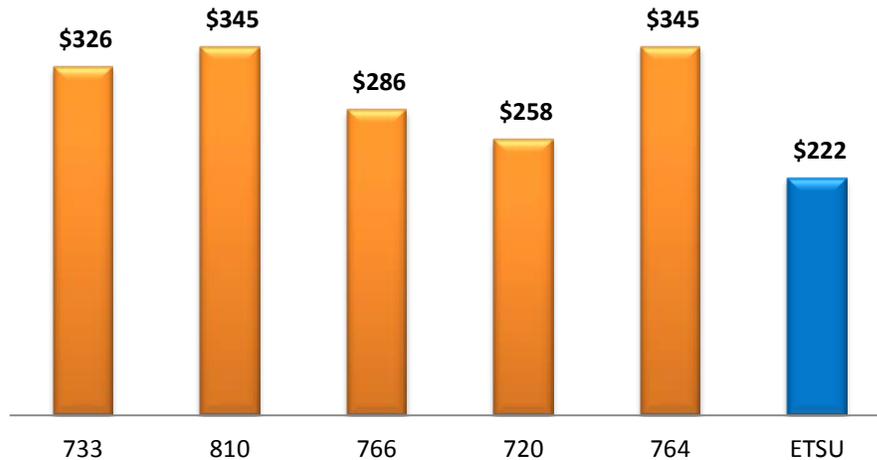


FY Total ⁴Budget Comparison for Operations



ETSU Facilities operational costs are well below other peer universities and SRAPPA surveyed institutions in the southeast. Using a measurement of cost per student, ESTU maintenance operates at \$222/student while Appalachian State University operates at \$345/student.

Maintenance Cost/Student



Maintenance costs which includes salary, benefits and expenses per managed square foot for ETSU are ^{1,4}\$0.57 which is the lowest of all peer comparisons. The SRAPPA in-house maintenance cost/sq. ft. is \$1.50; more than double our cost.

Operational effectiveness and efficiency is a process of continued change to meet new demands associated with academic programs and technology. Each division listed is unique and part of our operational model to deliver quality.



Power House & Utility Operations

East Tennessee State University owns and operates central cooling plant and heating plants. Each operation provides heating and chilled water for air conditioning to 33 buildings on main campus through an underground distribution network of piping.

The Chiller Plant Center consists of four Water Cooled Chillers with a combined total cooling capacity of 5,000 tons at 12,000 gallons per minute.

The Heating Plant Center consists of two Gas Boilers and three Coal Boilers with a combined heating capacity of 6.38 million BTU's. The Heating Plant is manned 24/7/365 by a staff of ³9 Boiler Operators.

The Centers utilize a Johnson Controls MetaSys, building management software (BMS) to monitor and control tempered air supply to buildings as well as domestic hot water. The BMS controls energy consumption through efficient control and implementation of energy savings control logic such as Peak Demand Limiting, Load Rolling and Temperature Resets.

The combined plants produce enough cooling and heating that would maintain about 1,600 average size homes.

Information relevant to the division's operation:

1. The division can generate 128,000 lbs. of steam if required. There are 3 coal boilers and 2 gas boilers
2. This past year ETSU used 162,760 MMBTU of natural gas.
3. ETSU is required to have a Title V air emissions permit for power house operations for coal burning operations.
4. The power uses natural gas as the primary source of fuel, with either coal or fuel oil as back up. Back up fuel is used when the University when supply is curtailed from the supplier when there are insufficient purchased supplies of natural gas in the transportation line.
5. Staffed with ³7 FTE and 2 floaters for a total of 9.
6. The Power House receives after hour calls from students, staff and Public Safety for facility maintenance request and critical support.



7. ETSU strip purchases natural gas in conjunction with spot market purchases. Last year the University locked in to a 12 month supply at specified rate for the year which provided savings during the past winter when fuel costs were high.
8. ETSU owns and manages a natural gas transportation line that feeds Valleybrook operations. This pipe line is governed by the Federal Energy Regulatory Commission.



Custodial Operations

Custodial operations are an all-inclusive custodial service performing at Level 2 APPA standards with Level 1 as best practices. The division uses a combination of in-house labor and external contractors for remote operations. Custodial operations are not just confined to main campus, but also include out parcels that ranges from Sevierville to Kingsport to Elizabethton.

Operational efficiencies for custodians are under constant review as related to program changes. For example:

1. Single stream recycling reduces the hours required to empty office trash and allows more time to common areas. This system has proved to be effective with the reduction in staff levels.
2. Alternate days of cleaning that follow private as well as industry practices were implemented and posted on department's web site.
3. Supplies are purchased from the State wide contract negotiated through general services.
4. Custodial initiated strategies for personnel assignments and inventory control which resulted in costs savings to the division. For example, paper towels and toilet paper are no longer inventoried in large quantities at the buildings with access by non-custodial personnel.

Some generic information related to custodial operations.

1. Personnel in custodial receive training in blood borne pathogens, ladder safety, and chemical handling.
2. Custodians are first responders to building flooding for cleanup as well as the person who changes light bulbs in most areas.
3. Custodial open and secure the buildings on campus.
4. Custodians perform event conversions for campus events in Memorial Center and Memorial Hall; in excess of 250 events annually.
5. The custodians prepare and clean areas used in sporting events; i.e. baseball, softball, and soccer.



- 6. Total custodians on staff: ³96 averaging ^{1,3}42,328 sq. ft./custodian which is the equivalent of 21.7 homes/custodian each night.

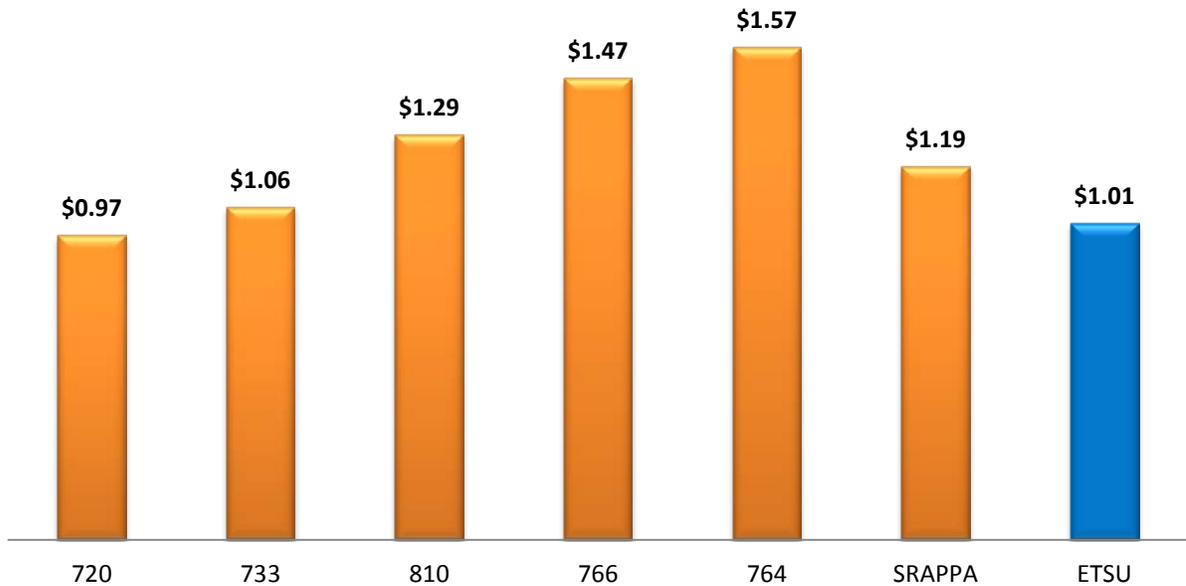
SRAPPA recommendation for Level 2 is 31,364 sq. ft./custodian.

- 7. Custodians provide for special set ups and event cleaning in the D.P. Culp Center.

Every program review requires a benchmark analysis on how do we compare to our peers. The following information clearly demonstrates that custodial operational efficiencies and fiscal control are obtained.

There are various costs that go into the overall cost per square foot. For example, ETSU’s costs include the division’s administrative costs as well as supplies.

^{1,4}Custodial Operations Cost/GSF





Energy Management Operations

Energy Management is a primary focus for cost efficiency. Second is the ability to manage the power distribution while still providing services to the researchers, staff, students, and other support services on campus. Most buildings operate on a four pipe system which uses chilled water to cool and steam coils to remove the humidity for tempered air. This operation requires steam and chilled water to be provided and managed on a continuous basis. Energy savings or cost avoidance by change in future spending was achieved with the following actions.

ECM measures that were implemented over the past year include the following.

1. Implementation of an energy policy to set heating at 68° in winter and cooling to 75°.
2. Replacement of lighting to LED.
3. Raise chilled water temperatures 2° which helps to prevent a second chiller coming on line.
4. Load shedding or “rolling” shut downs on air handlers in larger buildings; 13 buildings. Shut down is for about 10 minutes on the hour. There are CO2 over rides in place.
5. Set air handler schedules to occupancy times which includes weekend shut downs.
6. Shut down or isolate chilled water operations over break for substantial savings; \$80,000
7. Install lighting sensors in areas as part of renovation and green fee.
8. Each semesters class schedules are entered in the system for occupied settings; occupied settings versus un-occupied temperature settings.

There are issues that still need to be addressed.

1. This year’s utility costs/sq. ft. are the same as previous years
2. The NIH project at building 119 required a change in utility operations with movement of research animals to Brown Hall.
3. Air conditioning was added to Ross Hall, Powell Hall, and West Hall; ¹79,631 sq. ft.



ETSU energy costs related to other peer universities is shown below. What should be noted is that the cost per square foot this past year is the same as previous year with additional cooling loads and building renovations.

Campus heating and cooling systems are managed through MetaSys which is a computerized building management system. That same system is utilized as a secondary system for fire alarms and panic buttons on campus.

***Utility Costs /Sq Ft**



*The above utility costs EXCLUDE the College of Health Sciences. **SEE UTILITIES TAB**



Electrical Operations

Electrical Operations include a variety of services. There are ³⁷ electricians to cover all campus operations with the exception of College of Health Sciences. Main campus electricians provide support to all outlying campuses and Family Practices as needed.

Electricians provide the following support.

1. Present at all basketball games, special events, and graduations.
2. Set up power and temporary power to special events including LED boards in Memorial Center, campus events, Shelbridge.
3. Maintain all street lighting on all campuses.
4. Maintain Code Blue emergency phones.
5. Electricians secure electrical permits required by State.
6. Provide renovation support to multi-media rooms, minor renovations, and research.
7. Perform routine repair work across campus; over 1600 work orders.
8. First responders when elevators are out of service.
9. Work directly with Johnson City Power Board on high voltage issues on campus.
10. Change lighting components, high bays and all above 277 volts.



Fleet Operations (Motor Pool)

The Motor Pool is responsible for over 119 vehicles owned by the University that are operated by employees. Approximately 97 vehicles are Permanently Assigned to various departments within the University and 30 of those 97 are charged monthly flat rates and/or mileage. There are 22 vehicles that are part of the University's Fleet that are available for use for properly sanctioned meetings and activities. Motor Pool is also responsible for 36 gas powered golf carts and 17 electric carts that are owned or assigned throughout various departments within the University.

There are ³two mechanics that work the Motor Pool. Although the motor pool is primarily a 5 day operations, it is a 24/7 service operations since fleet vehicles travel all week and may experience problems or accidents. Both mechanics provide comprehensive vehicle services, maintain service records, dispatch travel, operate fueling operations, and service small operational equipment; i.e. golf carts and electric vehicles. They also provide services to the campus emergency generators.

Motor Pool's budget is determined by annual charges for permanently assigned vehicles and monthly charges for mileage, fuel and services submitted to the University's accounting department. Total charges submitted in FY 12/13 are detailed below:

Reserved vehicles	\$174,879.55 (total miles 378,560)
Services (includes off-site repairs)	\$ 38,734.92
Fuel	\$107,027.24
Permanently assigned vehicles monthly rate	\$132,995.00
Permanently assigned vehicles mileage rate	<u>\$ 41,195.68 (total miles 107,811)</u>
	<u>\$494,832.39</u>



Mechanical Operations

Mechanical Operations involve heating, ventilation, air conditioning (HVAC), and plumbing. Staffing levels include ³4 plumbers and ³5 HVAC certified mechanics. The division's functions include the maintenance of the following:

- 168 Air Handling Units
- 78 split systems
- 869 toilets
- 266 showers
- 1,730 Fan Coil Units
- 7 chillers
- 243 urinals
- 982 Variable Air Volume (VAV)
- 785 sinks
- 113 mop sinks

Duties and responsibilities are:

1. Provide support services at Main Meal in the D.P. Culp Center.
2. Each of the HVAC technicians possesses a universal EPA refrigeration license which allows them to work with various refrigerants used in campus units.
3. Make minor repairs to the steam/chilled water system on campus; including underground distribution system.
4. Answer/respond to all the hot and cold calls.
5. Provide a preventive maintenance program operation designed to help prevent catastrophic failure that impacts on faculty, staff, and students.
6. Changes air filters in all units across campus quarterly for indoor air quality.

HVAC technicians are trained to read and review the Johnson Controls MetaSys building management system. This is the computerized system that controls HVAC on the campuses. Further, MetaSys is used to alert Public Safety to fire alarms and panic buttons on campus.



Grounds/Horticulture Operations

There are two distinct programs operating on campus at this time; Grounds and Horticulture.

Grounds Operations consist of ³11 FTE's with the responsibility of managing 548 acres locally. In addition to normal grounds operations such as snow removal, ice control, mowing, mulching, edging, etc. they have accountability for several campus support activities.

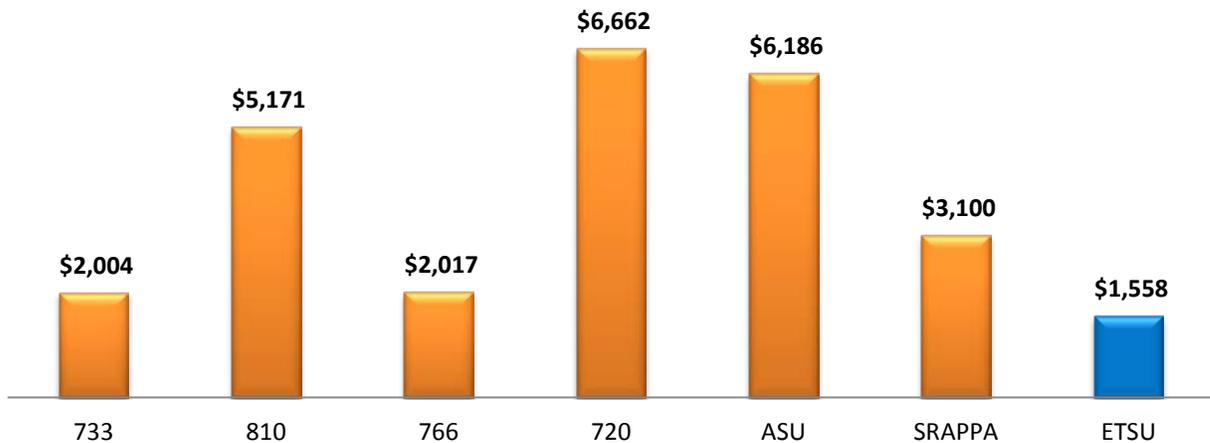
1. Sign installation and maintenance
2. Asphalt repair services
 - 40 plus parking lots
 - 6 miles of roads
 - Campus sidewalk surveys and recommendation
3. Special event setups and support across campus.
4. Pesticide applications
5. Solid waste removal: 75 trash containers, 77 dumpsters, special hauling during peak operations.
6. Arboretum with over 2,000 trees
7. Holston Mountain transmitter: weed control
8. Shelbridge support
9. Main campus: 210 acres
 - 18 acres for disk golf
 - 70 acres in University woods
 - 120 acres at Valley Brook
 - 99 acres at Kingsport Center
 - Innovation lab
 - Bee research facility



Horticulture consists of ³4 FTE's in the division with responsibility for shrub pruning, minor bed maintenance, and all flower plantings on campus. This is a new program which began in 2013 and is still expanding. Their accomplishments this past year include the following:

1. Install, plant, and manage 55 planters
2. Manage hanging basket program
3. Plant and maintain the large signs at key entrances to the campus
4. Create landscape planting plans as requested by various departments; install once approved
5. Manage the 2103 horticulture plan
6. Renovate small high visible areas as part of campus marketing
7. Certified in pesticide applications for weeds and spray
8. Mulching and edging a variety of beds across campus; over 1,000 bales of pine straw last year
9. Snow and ice control support on campus

⁴Grounds/Horticulture Operation Costs/*Acre



*Based on 548 acres



Housing Facilities

The essential tasks of the division of Housing Facilities are to provide maintenance and custodial operations, assist in design and project management of renovations, make properties ready for rental after vacancy, and maintain and clean properties for camps and conferences.

Our primary mode of communication with students is through an email listserv. Developed in 2009 it is a convenient way to email or text maintenance requests directly to the maintenance supervisor, the work order clerk (and others), allowing for prompt response and a computerized request trail.

Also of note is our recent Housing Facilities survey. Beginning in March 2012, each student using the listserv is now offered a short computerized survey after their work request is completed. Here are the results through April 1, 2014. Our response rate is currently 5%.

Question	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	N/A
1. The service technician(s) was professional, knowledgeable, and courteous?	3%	1%	3%	22%	57%	11%
2. The work completed was done satisfactorily?	5%	3%	4%	20%	66%	2%
3. Response time for the work order was acceptable?	5%	3%	3%	20%	68%	1%
4. Informed about any delays in completing the work?	6%	5%	6%	12%	22%	49%
5. If you were not at home, was there a note informing you that our technician had been there?	38% Yes		10% No		52% N/A	

General Information (Maintenance + Custodial includes salary, benefits and expenses)

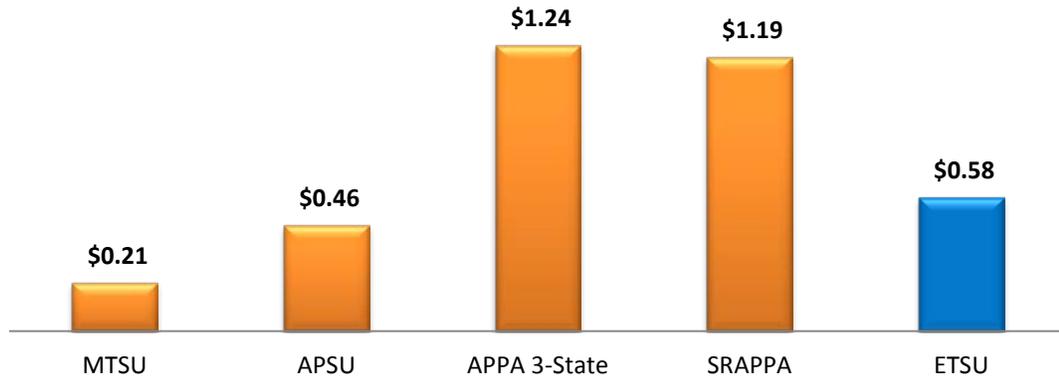
Beds available:	3,100
Total number of Residence Hall rooms:	790
Total number of Student Apartments:	864
Number of Staff Apartments:	15
Total Operations cost/yr:	⁴ \$1.72M
Total Operations cost/sq. ft.:	\$1.71/sq. ft. - ETSU \$2.70/sq. ft. - Three State Comparisons \$3.00/sq. ft. - SRAPPA



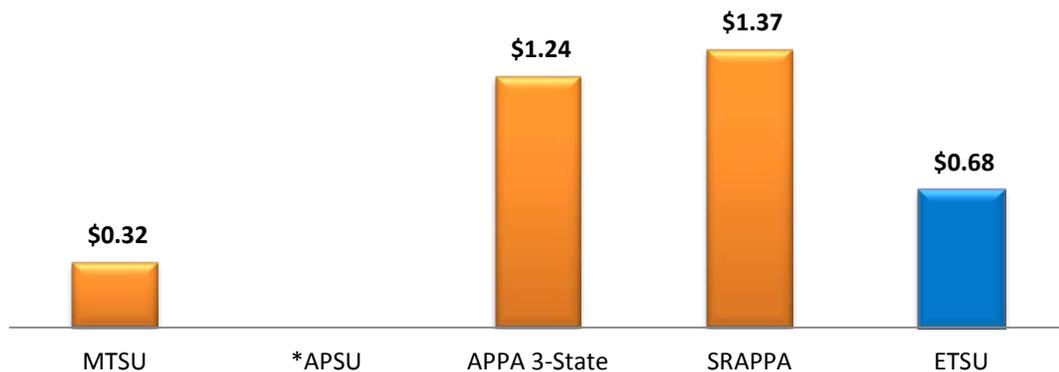
Custodial

Gross Sq. Ft. Housing Facilities:	⁵ 1,011,144 GSF
APPA Cleaning Level:	2 with 1 considered excellent
Number of custodians:	³ 18
Gross Sq. Ft. per custodian:	55,770/GSF
Cleaning product & bulb cost/sq. ft.	⁴ \$0.093/sq. ft.
⁴ Custodial labor cost/sq. ft.:	\$0.585/sq. ft. - ETSU \$2.70/sq. ft. - Three State Comparisons \$1.19/sq. ft. - SRAPPA
⁴ Total Custodial costs/sq. ft.:	\$0.68/sq. ft. - ETSU \$1.24/sq. ft. - Three State Comparisons \$1.37/sq. ft. - SRAPPA

⁴Housing - Custodial Labor Cost/Sq. Ft.



⁴Housing - Total Custodial Cost/Sq. Ft.



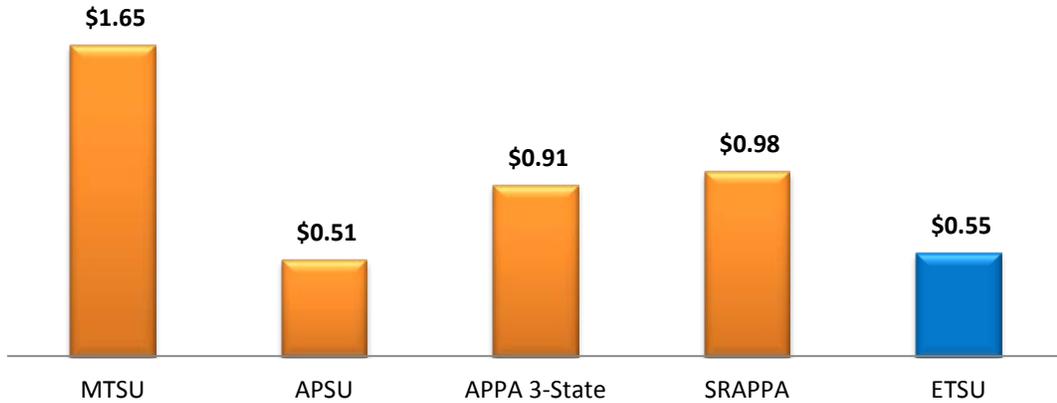
*APSU – N/A



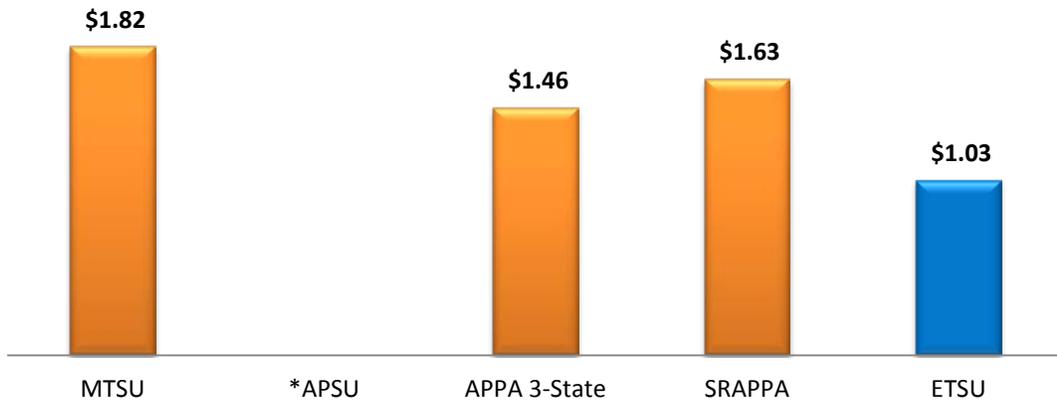
Maintenance

Gross Sq. Ft. Housing Facilities:	⁵ 1,011,144 GSF
Number of maintenance technicians:	³ 11
Maintenance materials and contract labor/sq. ft.:	\$0.487/sq. ft.
⁴ Maintenance labor costs/sq. ft.:	\$0.548/sq. ft. - ETSU \$0.91/sq. ft. - Three State Comparisons \$0.98/sq. ft. - SRAPPA
⁴ Total Maintenance costs/sq. ft.:	\$1.03/sq. ft. - ETSU \$1.46/sq. ft. - Three State Comparison \$1.63/sq. ft. - SRAPPA

⁴Housing - Maintenance Labor Cost/Sq. Ft.



⁴Housing - Total Maintenance Cost/Sq. Ft.



*APSU – N/A



Customer Service Operations

Customer Service operations manages a variety of task within the operational unit. Just to identify some of the more vital task:

- Manage 20,000 work orders submitted annually
- Manage carpenters, painters, and movers
- Maintain and analyze customer service feedback
- Perform charge back to departments for service rendered
- Perform and maintain building inspections used as back up data for TBR DB 70's which are used in the request for State maintenance dollars
- Maintain planning institutional effectiveness report generated annually
- Provide support to renovation/maintenance request

Carpenter Shop - The carpentry shop is responsible for general maintenance of a construction nature in relation with aesthetics, installation and operation of building items such as doors and windows, floors, ceilings, classroom teaching aids, furnishings, etc. Most maintenance items for this shop are handled through the computerized work order system. They will also handle minor in-house renovation projects.

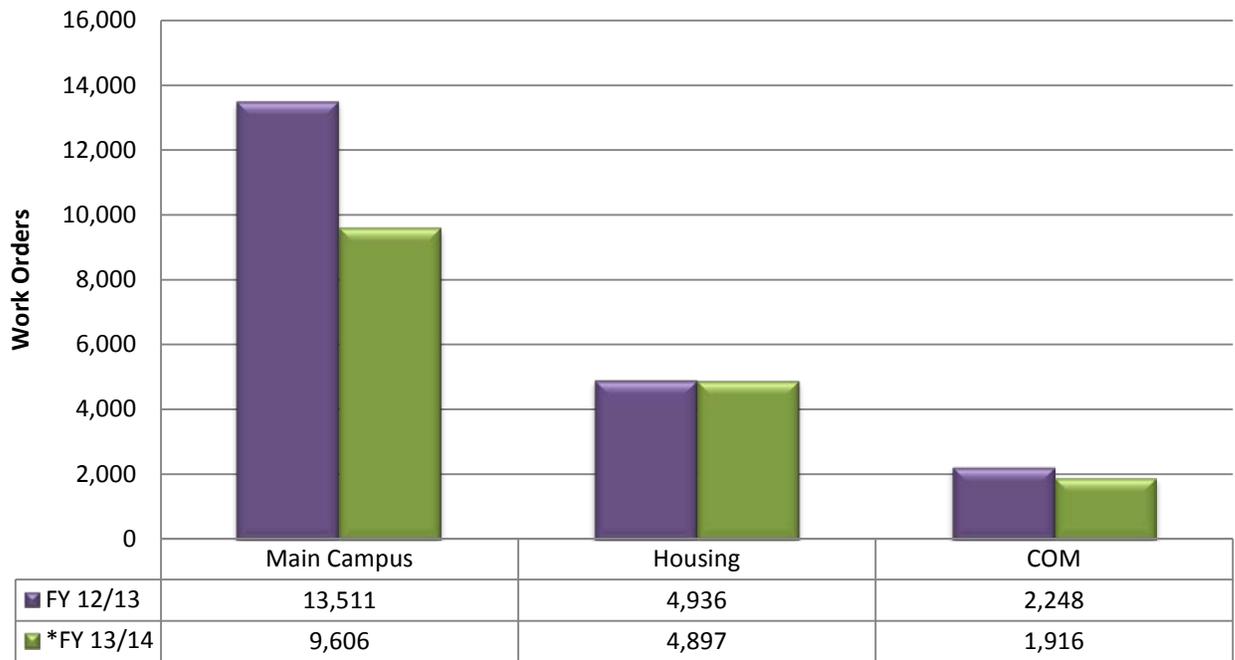
Paint Shop - The paint shop is responsible for painting the interior and exterior of University buildings, striping parking lots, painting miscellaneous items such as light poles, waste receptacles, street signage, etc. Preventative maintenance for the paint shop includes a seven year rotating plan where University buildings are painted every seven years. Parking stripes and street signage are painted annually.

Moving Shop - The moving crew assists University faculty and staff with moving and transporting large furnishings, bookshelves, equipment, etc. Requests are directed through the computerized work order system. They also remove items for surplus or to trash.

Charge back amounts in FY 12/13 totaled \$768,161.

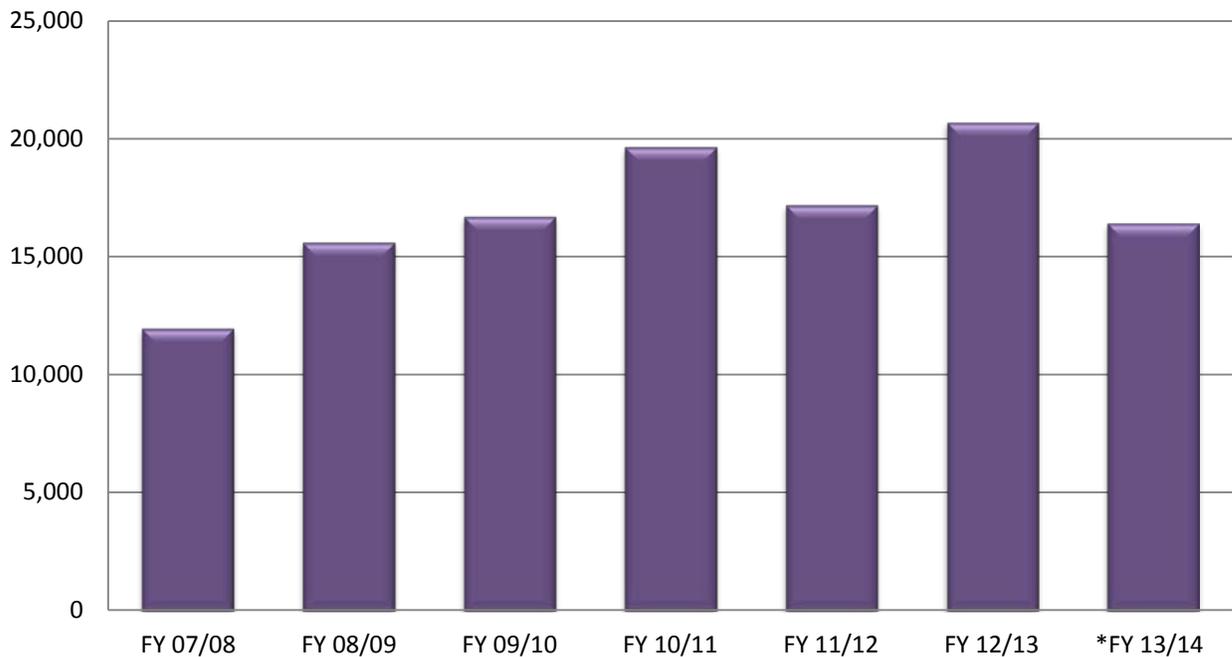


Work Order Summary by Area



*As of 04/23/2014

Work Orders Processed by FY

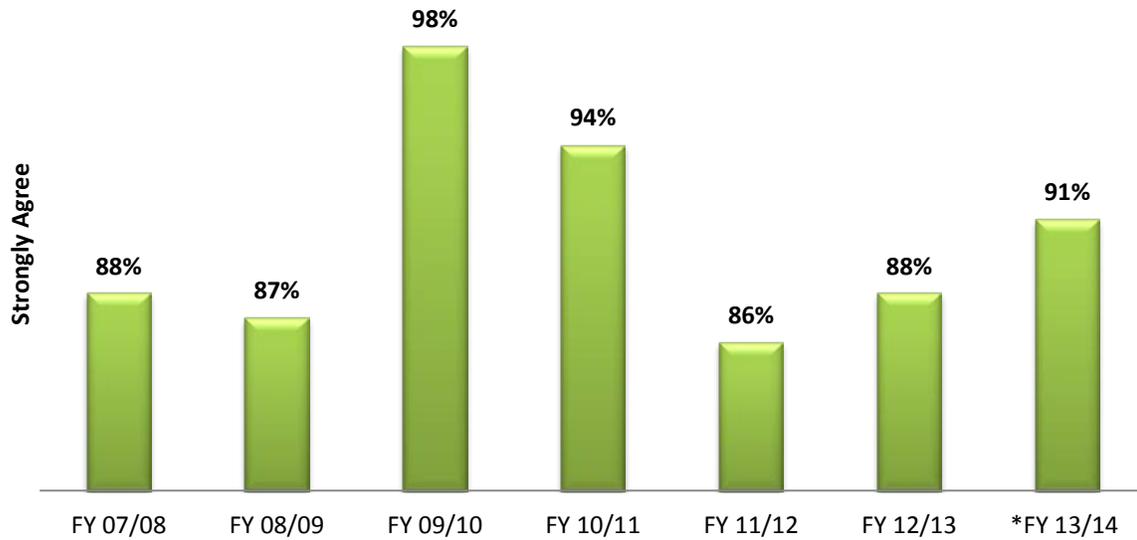


*As of 04/23/2014



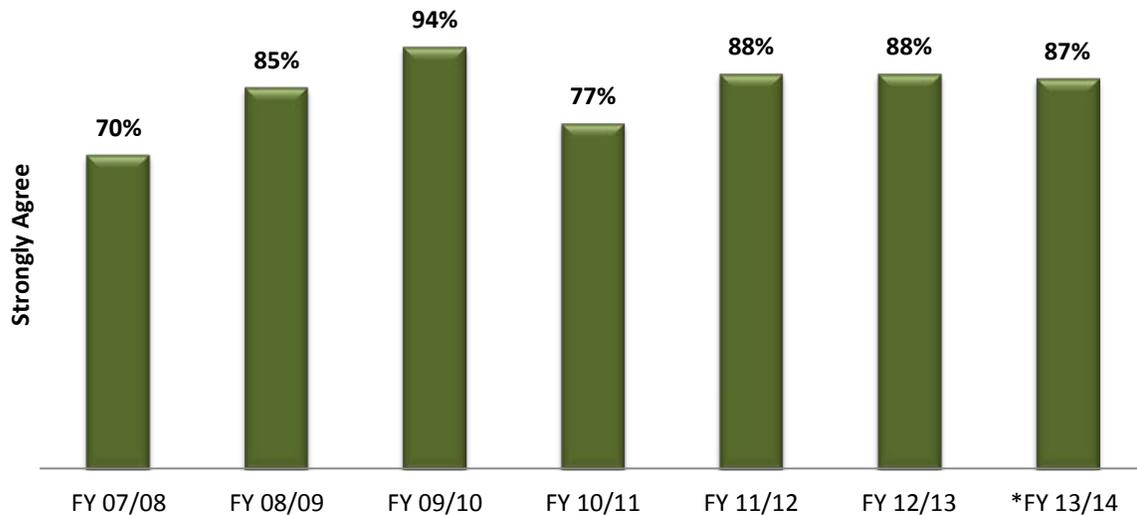
Customer Satisfaction Survey Results

The work completed was done satisfactorily?



*As of 04/23/2014

The service tech was professional, knowledgeable and courteous?



*As of 04/23/2014



College of Health Sciences

The College of Health Sciences consists as a group of medical related programs that includes:

- College of Medicine
- Physical Therapy
- Family Practice facilities
- College of Pharmacy
- Forensics/Toxicology center
- Clinical Education facilities

In addition to the educational aspects of these programs, the division has responsibility to support the operation of medical research laboratories in the performance of multi-million dollar medical research operations and the responsibility to support the animal housing facilities utilized by the medical research operations. The division also provides safe and comfortable facilities for all direct patient care areas of the Family Practice centers and the Clinical Education facilities.

Daily Duties:

- Perform preventive maintenance tasks for all mechanical, electrical and building systems.
- Complete work requests submitted by all departments in the College of Health Sciences located on and off the VA campus.
- Provide project management of both TBR construction projects and locally bid construction projects.
- Order maintenance supplies, replacement parts and custodial supplies.
- Provide minor in-house renovations to include electrical installations, HVAC installations, room reconfigurations and installation of new finishes.
- Monitor all HVAC equipment in College of Health Sciences buildings on the VA campus through MetaSys, including the monitoring of ultra-low freezers, cold rooms and animal housing areas.
- Provide setup services for all College of Health Sciences events on the VA campus.
- Provide daily cleaning of all College of Health Sciences buildings.



Facilities Management
Maintenance & Operations

	Custodial	***Maintenance	Total
Number of Budgeted Employees:	³ 24	³ 12	36
Total Square Footage:	⁵ 536,824	⁵ 722,911	722,911
Total Square Foot per Employee:	*22,368	60,243	20,081
Budgeted Salary & Benefits (COM, COP, MEAC):	\$674,503	\$418,799	\$1,093,302
Budgeted Salary & Benefits per Square Foot:	\$1.26	\$0.58	\$1.51
Budgeted Operating Expenses (COM, COP, MEAC):	**\$102,508	\$478,200	\$580,708
Budgeted Operating Expenses per Square Foot:	\$0.19	\$0.66	\$0.80
Total Operating, Salary & Benefits per Square Foot:	\$1.45	\$1.24	\$2.32

*Median size of U.S. residential home in South is 2,083 sq. ft. One custodian cleaning 22,368 sq. ft. is the equivalent of cleaning 10.8 homes per shift.

**Total Custodial Operating Expenses comprises of \$50,000 to Stericycle Hazardous Waste

***Maintenance includes Administrative positions

	VA Campus	*Off Site	Total
Total Buildings:	⁵ 12	⁵ 9	21
Total Square Foot per Location:	536,824	186,087	722,911

*Off Site Locations consist of clinics, offices & resident centers located in Mountain City, Kingsport, Bristol and Johnson City.



Custodial Cost per GSF



Maintenance Cost per GSF

