Local Government Energy Audit Report

Travers Wolfe Hall

Mary 6, 2021

Prepared for:

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Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information about financial incentives that may be available. Most energy conservation measures have received preliminary analysis of feasibility that identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to establish a basis for further discussion and to help prioritize energy measures.

TRC reviewed the energy conservation measures and estimates of energy savings for technical accuracy. Actual, achieved energy savings depend on behavioral factors and other uncontrollable variables and, therefore, estimates of final energy savings are not guaranteed. TRC and the New Jersey Board of Public Utilities (NJBPU) shall in no event be liable should the actual energy savings vary.

TRC bases estimated material and labor costs primarily on RS Means cost manuals as well as on our experience at similar facilities. This approach is based on standard cost estimating manuals and is vendor neutral. Cost estimates include material and labor pricing associated with one for one equipment replacements. Cost estimates do not include demolition or removal of hazardous waste. The actual implementation costs for energy savings projects are anticipated to be significantly higher based on the specific conditions at your site(s). We strongly recommend that you work with your design engineer or contractor to develop actual project costs for your specific scope of work for the installation of high efficiency equipment. We encourage you to obtain multiple estimates when considering measure installations. Actual installation costs can vary widely based on selected products and installers. TRC and NJBPU do not guarantee cost estimates and shall in no event be held liable should actual installed costs vary from these material and labor estimates.

New Jersey's Clean Energy Program (NJCEP) incentive values provided in this report are estimates based on program information available at the time of the report. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

The customer and their respective contractor(s) are responsible to implement energy conservation measures in complete conformance with all applicable local, state, and federal requirements.

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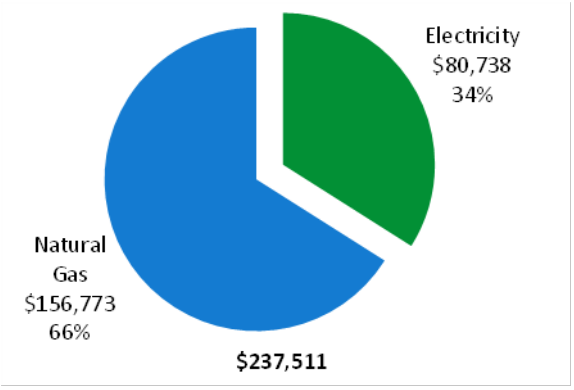
1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for Travers Wolfe Hall. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help make changes in your facility. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Utilities	Costs: $237,511 Electricity: 2,834,022 kWh Natural Gas: 370,525 Therms	
ENERGY STAR® Benchmarking Score	N/A *(1-100 scale)*	A standard energy use benchmark is not available for this facility type. This report contains suggestions about how to improve building performance and reduce energy costs.

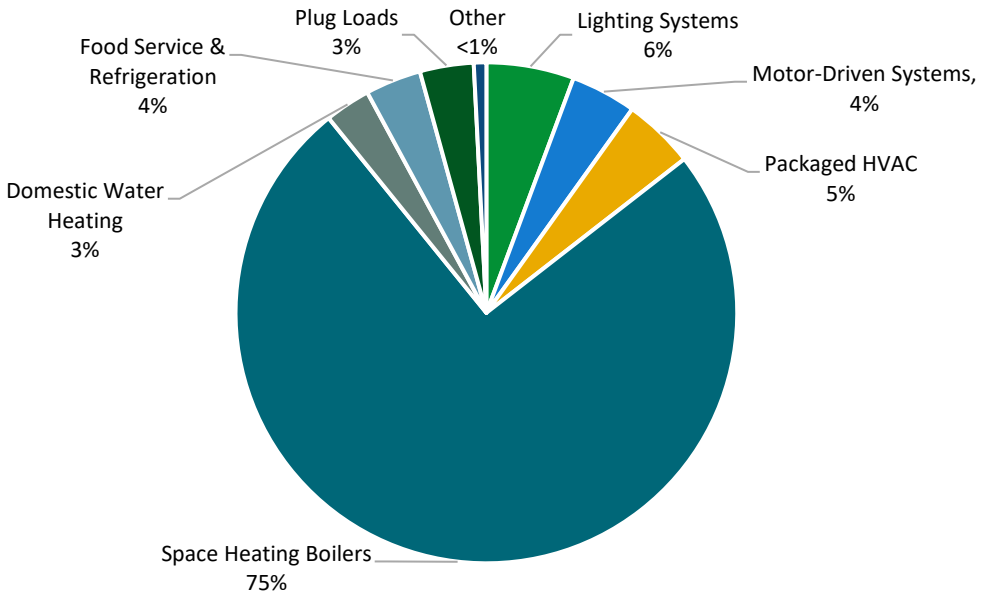


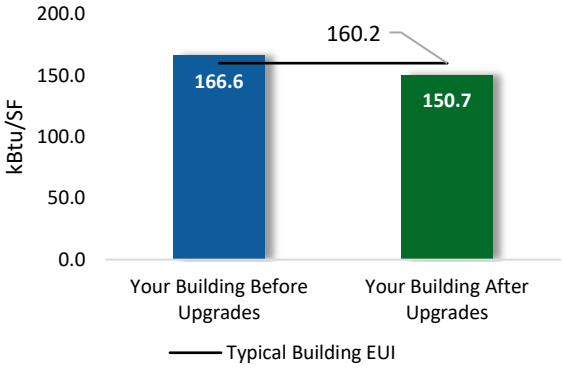
Figure 1 - Energy Use by System

POTENTIAL IMPROVEMENTS

This energy audit considered a range of potential energy improvements in your building. Costs and savings will vary between improvements. Presented below are two potential scopes of work for your consideration.

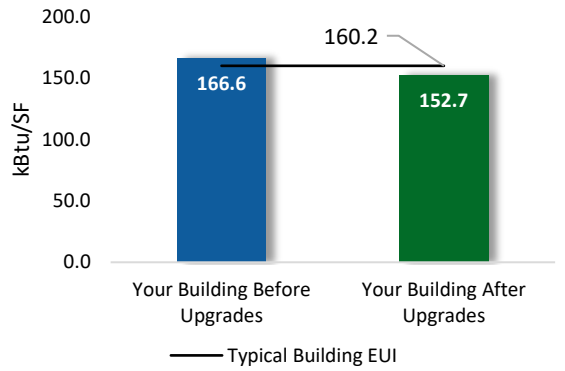
Scenario 1: Full Package (all evaluated measures)

Installation Cost	$946,235
Potential Rebates & Incentives[1]	$71,900
Annual Cost Savings	$141,026
Annual Energy Savings	Electricity: 920,866 kWh Natural Gas: 13,120 Therms
Greenhouse Gas Emission Savings	540 Tons
Simple Payback	6.2 Years
Site Energy Savings (all utilities)	10%



Scenario 2: Cost Effective Package[2]

Installation Cost	$406,843
Potential Rebates & Incentives	$60,121
Annual Cost Savings	$116,455
Annual Energy Savings	Electricity: 753,480 kWh Natural Gas: 13,248 Therms
Greenhouse Gas Emission Savings	457 Tons
Simple Payback	3.0 Years
Site Energy Savings (all utilities)	8%



On-site Generation Potential

Photovoltaic	Medium
Combined Heat and Power	None

[1] Incentives are based on current SmartStart Prescriptive incentives. Other program incentives may apply.

[2] A cost-effective measure is defined as one where the simple payback does not exceed two-thirds of the expected proposed equipment useful life. Simple payback is based on the net measure cost after potential incentives.

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**401,739**	**57.5**	**-84**	**$58,749**	**$114,256**	**$25,537**	**$88,719**	**1.5**	**394,757**
ECM 1	Install LED Fixtures	Yes	678	0.0	0	$100	$509	$50	$459	4.6	683
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	867	0.5	0	$127	$756	$110	$646	5.1	852
ECM 3	Retrofit Fixtures with LED Lamps	Yes	400,193	57.0	-83	$58,522	$112,991	$25,377	$87,614	1.5	393,222
Lighting Control Measures			**95,406**	**12.2**	**-20**	**$13,951**	**$197,203**	**$14,209**	**$182,994**	**13.1**	**93,737**
ECM 4	Install Occupancy Sensor Lighting Controls	No	61,472	9.4	-13	$8,989	$180,778	$3,779	$176,999	19.7	60,397
ECM 5	Install High/Low Lighting Controls	Yes	33,934	2.8	-7	$4,962	$16,425	$10,430	$5,995	1.2	33,341
Variable Frequency Drive (VFD) Measures			**224,715**	**25.1**	**0**	**$33,060**	**$402,564**	**$13,750**	**$388,814**	**11.8**	**226,287**
ECM 6	Install VFDs on Constant Volume (CV) Fans	Yes	116,375	17.2	0	$17,121	$40,560	$5,675	$34,885	2.0	117,189
ECM 7	Install VFDs on Heating Water Pumps	No	66,530	4.9	0	$9,788	$192,309	$4,400	$187,909	19.2	66,996
ECM 8	Install VFDs on Kitchen Hood Fan Motors	Yes	2,426	0.4	0	$357	$3,391	$75	$3,316	9.3	2,443
ECM 9	Install VFDs on Water Supply Pump	No	39,384	2.6	0	$5,794	$166,305	$3,600	$162,705	28.1	39,659
Unitary HVAC Measures			**131,551**	**30.3**	**0**	**$19,353**	**$170,784**	**$14,898**	**$155,886**	**8.1**	**132,471**
ECM 10	Install High Efficiency Air Conditioning Units	Yes	131,551	30.3	0	$19,353	$170,784	$14,898	$155,886	8.1	132,471
Domestic Water Heating Upgrade			**0**	**0.0**	**332**	**$1,403**	**$5,012**	**$2,796**	**$2,216**	**1.6**	**38,832**
ECM 11	Install Low-Flow DHW Devices	Yes	0	0.0	332	$1,403	$5,012	$2,796	$2,216	1.6	38,832
Food Service & Refrigeration Measures			**14,434**	**1.7**	**0**	**$2,124**	**$7,316**	**$710**	**$6,606**	**3.1**	**14,535**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	6,160	0.8	0	$906	$4,246	$560	$3,686	4.1	6,203
ECM 13	Replace Refrigeration Equipment	Yes	3,902	0.4	0	$574	$2,150	$0	$2,150	3.7	3,929
ECM 14	Vending Machine Control	Yes	4,372	0.5	0	$643	$920	$150	$770	1.2	4,403
Custom Measures			**53,022**	**0.0**	**1,084**	**$12,386**	**$49,100**	**$0**	**$49,100**	**4.0**	**180,302**
ECM 15	Installation of an Energy Management System	Yes	24,681	0.0	713	$6,649	$40,000	$0	$40,000	6.0	108,380
ECM 16	Sub Metering	Yes	28,340	0.0	371	$5,737	$9,100	$0	$9,100	1.6	71,922
TOTALS (COST EFFECTIVE MEASURES)			**753,480**	**109.9**	**1,325**	**$116,455**	**$406,843**	**$60,121**	**$346,723**	**3.0**	**913,869**
TOTALS (ALL MEASURES)			**920,866**	**126.7**	**1,312**	**$141,026**	**$946,235**	**$71,900**	**$874,335**	**6.2**	**1,080,920**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 2 – Evaluated Energy Improvements

For more detail on each evaluated energy improvement and a break out of cost-effective improvements, see **Section 4: Energy Conservation Measures**.

1.1 Planning Your Project

Careful planning makes for a successful energy project. When considering this scope of work, you will have some decisions to make, such as:

- How will the project be funded and/or financed?
- Is it best to pursue individual ECMs, groups of ECMs, or use a comprehensive approach where all ECMs are installed together?
- Are there other facility improvements that should happen at the same time?

Pick Your Installation Approach

New Jersey's Clean Energy Programs give you the flexibility to do a little or a lot. Rebates, incentives, and financing are available to help reduce both your installation costs and your energy bills. If you are planning to take advantage of these programs, make sure to review incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives before purchasing materials or starting installation.

The potential ECMs identified for this building likely qualify for multiple incentive and funding programs. Based on current program rules and requirements, your measures are likely to qualify for the following programs:

Energy Conservation Measure		SmartStart	Direct Install	Pay For Performance
ECM 1	Install LED Fixtures	x		x
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x		x
ECM 3	Retrofit Fixtures with LED Lamps	x		x
ECM 4	Install Occupancy Sensor Lighting Controls	x		x
ECM 5	Install High/Low Lighting Controls	x		x
ECM 6	Install VFDs on Constant Volume (CV) Fans	x		x
ECM 7	Install VFDs on Heating Water Pumps	x		x
ECM 8	Install VFDs on Kitchen Hood Fan Motors	x		x
ECM 9	Install VFDs on Water Supply Pump	x		x
ECM 10	Install High Efficiency Air Conditioning Units	x		x
ECM 11	Install Low-Flow DHW Devices	x		x
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	x		x
ECM 13	Replace Refrigeration Equipment			x
ECM 14	Vending Machine Control	x		x
ECM 15	Installation of an Energy Management System			
ECM 16	Sub Metering			

Figure 3 – Funding Options

New Jersey's Clean Energy Programs At-A-Glance

	SmartStart Flexibility to install at your own pace	**Direct Install** Turnkey installation	**Pay for Performance** Whole building upgrades
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Incentives are paid out in three installments. The first installment is meant to help offset the costs of the initial engineering study. The subsequent incentives are paid based on the level of energy savings up to 50% of the total project cost. See Section 7.3 for all incentive details.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.

Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.

Individual Measures with SmartStart

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation.

Turnkey Installation with Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized network of participating contractors. This program can provide substantially higher incentives than SmartStart, up to 70 percent of the cost of selected measures. Direct Install contractors will assess and verify individual measure eligibility and, in most cases, they perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Whole Building Approach with Pay for Performance

Pay for Performance can be a good option for medium to large sized facilities to achieve deep energy savings. Pay for Performance allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program (ESIP) loan also use this program. Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures resulting in at least 15 percent energy savings, where lighting cannot make up the majority of the savings.

More Options from Around the State

Financing and Planning Support with the Energy Savings Improvement Program (ESIP)

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the ESIP. Supported directly by the NJBPU, ESIP provides government agencies with project development, design, and implementation support services, as well as, attractive financing for implementing ECMs. You have already taken the first step as an LGEA customer, because this report is required to participate in ESIP.

Resiliency with Return on Investment through Combined Heat & Power (CHP)

The CHP program provides incentives for combined heat and power (aka cogeneration) and waste heat to power projects. Combined heat and power systems generate power on-site and recover heat from the generation system to meet on-site thermal loads. Waste heat to power systems use waste heat to generate power. You will work with a qualified developer who will design a system that meets your building's heating and cooling needs.

Ongoing Electric Savings with Demand Response

The Demand Response Energy Aggregator program reduces electric loads at commercial facilities when wholesale electricity prices are high or when the reliability of the electric grid is threatened due to peak power demand. By enabling commercial facilities to reduce electric demand during times of peak demand, the grid is made more reliable and overall transmission costs are reduced for all ratepayers. Curtailment service providers provide regular payments to medium and large consumers of electric power for their participation in demand response (DR) programs. Program participation is voluntary, and facilities receive payments regardless of whether they are called upon to curtail their load during times of peak demand.

2 EXISTING CONDITIONS

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) Report for Travers Wolfe Hall. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs. This report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

TRC conducted this study as part of a comprehensive effort to assist New Jersey educational and local government facilities in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

2.1 Site Overview

On October 29, 2020, TRC performed an energy audit at Travers Wolfe Hall located in Ewing, New Jersey. TRC met with Kevin Myles to review the facility operations and help focus our investigation on specific energy-using systems.

Travers Wolfe Hall is a 12-story, 280,494 square foot building built in 1971. The facility has two identical and mirrored dormitory towers (Travers and Wolfe). They are linked by a Dining Hall and a Main lounge area. Spaces include dorm rooms, offices, restrooms, laundry rooms, elevator lobbies, a main lounge, a dining hall, a commercial kitchen, a repair shop, a multipurpose room, stairwells, and basement mechanical space. The building is fully heated and partially cooled.

There is also a four-floor parking garage located outside the building. The garage is unconditioned space and not included in the building square footage. Garage lighting, however, has been included in the audit.

Over the last few years, the facility has upgraded some of its existing fluorescent lighting to LED lighting.

Facility main concerns include sub-metering and upgrading their existing HVAC and lighting systems where possible.

2.2 Building Occupancy

The facility is occupied year-round. Typical weekday occupancy is 5 staff and 557 students. As a residence hall, the building is open 24/7 for students use. The Dining Hall is open from 5:00 PM to 1:00 AM and is used to serve meals to students and faculty.

The facility has minimal occupancy during the winter and the summer breaks.

Building Name	Weekday/Weekend	Operating Schedule
Travers-Wolfe Hall Dorms	Weekday	24/7
	Weekend	24/7
Travers-Wolfe Dining Hall	Weekday	5:00PM - 1:00AM
	Weekend	Varies

Figure 4 - Building Occupancy Schedule

2.3 Building Envelope

Building exterior walls are formed of brick cavity walls with concrete masonry units (CMUs). The dining hall and main lounge walls are made of concrete block with a stucco facade. The interior of the building is constructed with CMUs and plaster finish. The front of the building is also equipped with a clear skylight roof for the dining hall.

The majority of the roof is flat and appears to be covered with a white single-ply membrane. It is insulated and appears to be in fair condition.

Most of the windows are clear, double paned, and have metal frames. The glass-to-frame seals are in poor condition. The operable window weather seals are in poor condition, showing evidence of excessive wear. Exterior doors are formed of metal and coated glass with metal frames. Doors are in good condition with undamaged door seals. Degraded window and door seals increase drafts and outside air infiltration. The interior doors of the building are made of wood and have wooden frames.

Building Exterior

Exterior Doors

Exterior Windows

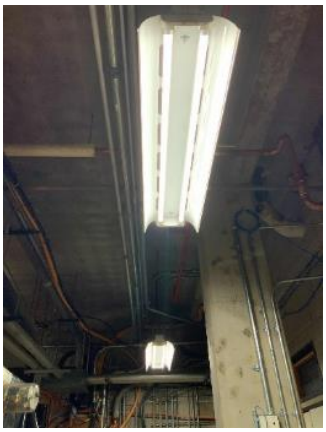
Exterior Roof

2.4 Lighting Systems

The primary interior lighting system uses linear fluorescent fixtures, mainly with 32-Watt T8 lamps. Some have been retrofit with LED tubes. There are also a few 28-Watt T5 and 40-Watt T12 fluorescent fixtures. A significant number of ceiling mounted, decorative pendant, and recessed fixtures use LED sources. Additionally, there are some compact fluorescent lamps (CFL) and incandescent fixtures in service spaces, many of which have been retrofit with LED general purpose lamps. Typically, T8 fluorescent lamps use electronic ballasts and T12 fluorescent lamps use magnetic ballasts.

The linear fixture types include 1- 2- 3- or 4-lamp, 2- 3- or 4-foot long troffer and surface mounted fixtures. There are also several 2-foot fixtures with U-bend and linear tube lamps.

T8 Linear Fluorescent Fixtures



LED Linear Tubes

CFL Fixtures

LED Fixtures

Typically, each dorm room is equipped with two single-lamp, four-foot linear fluorescent T8 wall mounted fixtures and one 2-lamp 2-foot T8 fixture.

Dorm hallways are equipped with U-bend fluorescent troffer fixtures and the building stairwells have a mixture of linear fluorescent and U-bend fluorescent T8 fixtures.

The mechanical pump rooms are equipped with 2-lamp, 40-Watt, T12 fixtures. The kitchen area is equipped with 28-Watt, T5 linear fluorescent fixtures.

The laundry rooms and the break rooms are equipped with linear fluorescent T8 fixtures. The main lounge is equipped with linear fluorescent T8 and LED decorative pendant fixtures. Each decorative LED pendant fixtures is equipped with fifteen, 15-Watt bulbs. Fixtures are controlled manually and are in good operating condition.

The dining hall is equipped with linear fluorescent, U-bend fluorescent, compact fluorescent, halogen incandescent, and LED fixtures. Fixtures include surface mounted, canopy, canned, wall sconces, and decorative pendant fixtures. Lamp wattages range from 9- to 35-Watts.

Janitorial closets throughout the building are equipped with either 26-Watt compact fluorescent lamps or 9-Watt, A21 LED lamps. The electrical generator rooms in the building are equipped with 2-lamp LED linear tubes.

Basement Hallway Lighting

Main Lounge Fixtures

Dorm Horseshoe Hallway Fixtures

Dining Hall Fixtures

All exit signs are LED. Interior lighting levels were generally sufficient.

Most lighting fixtures are controlled manually by wall switches. Occupancy sensors are found in dining area controlling the U-bend fluorescent fixtures. The horseshoe hallway fixtures in the dormitory are controlled by a timer.

Exit Sign - LED

Occupancy Sensor

Timer

Exterior lighting includes canopy, wall pack, pendant and surface mounted fixtures that use either CFL, HID or LED lamps. These fixtures range from 26 to 250 Watts and are controlled via a timer.

The parking garage associated with this building is equipped with 60-Watt ceiling mounted LED fixtures that operate continuously. The parking garage roof area is illuminated by pole mounted LED fixtures. They are assumed to be controlled by a timeclock.

The site has pole mounted acorn top LED fixtures illuminating roadways and parking lots throughout the complex. These are 30-Watt walkway fixtures, controlled by campus GPS timers. They operate roughly 9 hours a day.

Wall pack - CFL

Flood Light - HID

Wall Pack - CFL

Downlight Fixtures

Canopy Fixtures

Canned Fixtures

Parking Garage Fixtures

Parking Garage Pole Mounted Fixtures

2.5 Air Handling Systems

Unitary Heating Equipment

Dorm rooms 112T, 613T, 615T, and 615W are equipped with electric resistance heaters. These heaters range in capacity from 2.56 MBh to 5.12 MBh. They are estimated to have a COP of 1 and are in good operating condition.

Unitary Electric HVAC Equipment

Some dorm rooms, IT rooms, computer rooms, and offices are air conditioned by unitary electric HVAC equipment, including split air conditioning (AC) systems and window ACs.

The four dorm rooms with resistance heaters, noted above, are equipped with window air conditioners for cooling. At the time of the site visit, resident staff apartment 13, 14 and 15 were inaccessible. According to the site rep, these apartments are each served by a 1.50-ton window AC.

The Travers and Wolfe IT rooms are served by Daikin ductless mini-split heat pumps (HP), each with a 3-ton cooling capacity and 40 MBh heating capacity. Dorm rooms are mainly conditioned by multiple Sanyo and Mitsubishi units. These heat pumps have a 0.75-ton cooling capacity and range in heating capacity from 10.90 MBh to 12.20 MBh.

The elevator machine rooms in Wolfe and Travers are each equipped with two Carrier ductless mini-split HPs. They each have a 3-ton cooling capacity and 36 MBh heating capacity and are in good operating condition.

There is also a packaged terminal heat pump unit located in the kitchen office. This unit is estimated to have 0.75 ton cooling capacity and 8.20 MBh heating capacity. It appears to be in good operating condition.

Electric Resistance Heater

Ductless Mini-Split AC

Ductless Mini-Split AC

Ductless Mini-Split AC

Dorm Window AC

Kitchen Packaged Terminal HP

Air Handling Units (AHUs)

The building linkage (core area) between the two dorms is fully conditioned by three air handling units. These air handling units are equipped with supply fan motors and hot water coils. The supply fan motors for these units range from 10 to 15 hp. They are equipped with standard efficiency constant speed motors.

The systems include an outdoor condensing unit for each air handling unit. These units range in cooling capacity from 41.22 to 102 tons. These units are old and are in poor condition. There is a split air-conditioning (AC) system configuration. The heating coil is supplied by a steam to hot water heat exchanger system, which is described in the section that follows.

There is also a heating-ventilation unit located in the kitchen storage room. Serving the kitchen, this unit is equipped with a supply fan motor and is also tied to the hot water heat exchanger loop.

CU –003

CU - 002

AHU-003

Kitchen HV Unit

2.6 Steam /Hot Water System

Steam is supplied by boilers and the cogeneration heat recovery system located in the Power House/Cogen Building. Steam is used in this building to produce space heating water and domestic hot water through steam heat exchangers.

Space heating water is circulated to baseboard heating throughout the building by four heating hot water pumps. These pumps range from 7.5 to 15 hp. The pumps run at constant speed and serve a zonal system. The 7.5 hp pumps serve the Wolfe side of the building while the 15 hp pumps serve the Travers side of the building.

Energy use associated with producing steam was allocated to individual buildings served by the cogeneration system and boilers. Please see the Power House/Cogen building report for details regarding the steam system.

Heat Exchanger

Heating Hot Water Pumps

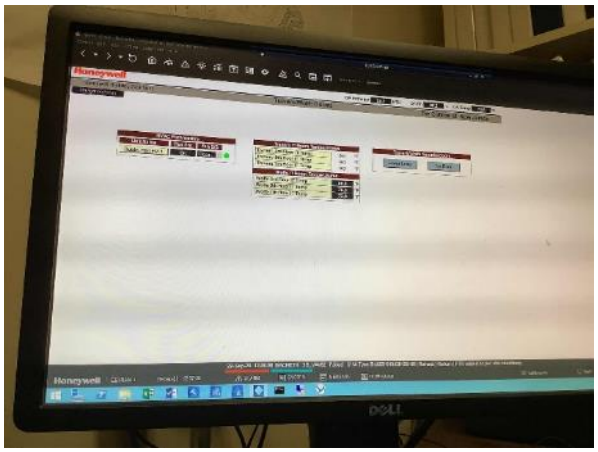
Condensate Return Pumps

End Use Equipment

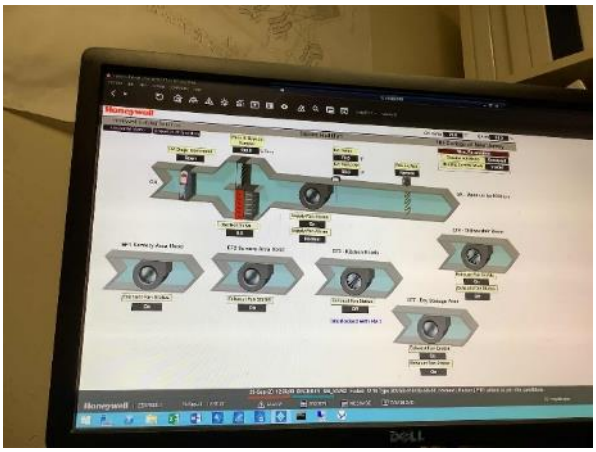
2.7 Building Energy Management Systems (EMS)

A Honeywell EMS controls the kitchen HV unit. It monitors space temperatures, supply air temperature, heating water loop temperature, and outside air temperature.

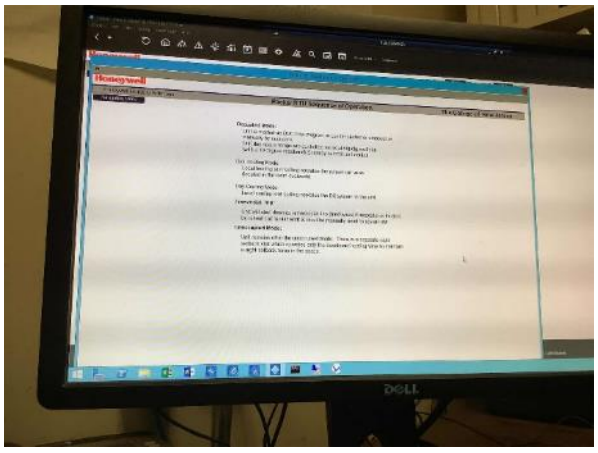
The site staff expressed an interest in expanding the level of control provided by the EMS for this building.



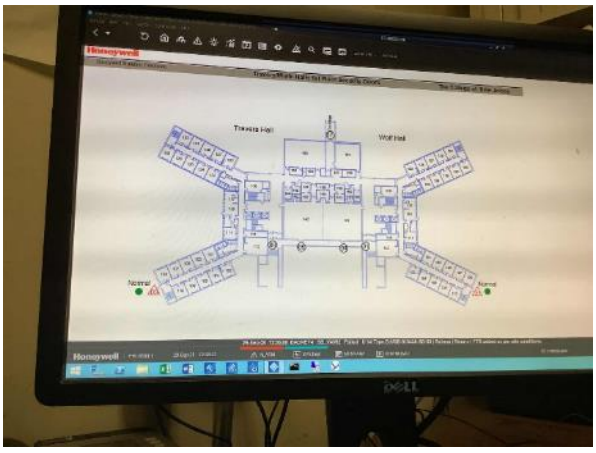
Energy Management System



Energy Management System



Energy Management System



Energy Management System

2.8 Domestic Hot Water

Hot water is produced by heat exchangers using steam from the central space heating boiler. Two 5.0 hp circulation pumps distribute water to end uses for each building. The domestic hot water pipes are insulated.

Apartment 114 and Room 23 are each served by an electric storage tank water heater. Both units have a 4.50- kW heating element and a 40-gallon tank storage capacity.

Travers Steam DHW System

Wolfe Steam DHW System

Electric DHW Storage Tank

Electric DHW Storage Tank

2.9 Food Service Equipment

The kitchen has a mixture of gas and electric equipment that is used to prepare dinner for students and staff. Most cooking is done using a convection oven and gas griddles. The commercial kitchen area includes a gas vat fryer and a gas steamer. Bulk prepared foods are held in several electric holding cabinets. The kitchen equipment appears to be in fair condition.

Miscellaneous kitchen equipment such as an electric kettle, a dough maker, a pizza oven, heat cups, flour mixer, buffet tables, and warming units were also noted.

Please refer to Section 3.2 for a discussion regarding the dedicated kitchen gas service.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high efficiency food service equipment.

Griddle

Stove/Oven

Convection Ovens

Large Vat Fryer

Steamer

Kettle

Misc. Cooking Equipment

Misc. Cooking Equipment

2.10 Refrigeration

The kitchen has several stand-up refrigerators and freezers with solid doors. There is also a freezer chest in the cafeteria. All equipment is in good condition.

There are multiple walk-in refrigerators and freezers located in this building. They range in compressor capacity from 1.1- to 1.58 tons. Depending on walk in size, the quantity of evaporators range between one and four per unit. According to the site representative, some of the units are being replaced.

Visit https://www.energystar.gov/products/commercial_food_service_equipment for the latest information on high efficiency food service equipment.

Walk-In Refrigerator

Solid Door Freezer

Novelty Cooler

Refrigerator

2.11 Plug Load & Vending Machines

The location is doing a great job managing their electrical plug loads. This report makes additional suggestions for ECMs in this area as well as Energy Efficient Best Practices.

Loads throughout the building include general café and office equipment. Laundry room washer and dryers are found in the building. The lounges of the building are equipped with televisions and water coolers for entertainment purposes. Dorm rooms contain equipment typically used by students, including portable lamps and computers.

There are several residential style refrigerators throughout the building. These vary in condition and efficiency.

There are two glass fronted refrigerated beverage vending machines and one non-refrigerated vending machine located in the building. Vending machines are not equipped with occupancy-based controls.

Laundry Room Equipment

Office Café Plug loads

Office Café Plug loads

Vending Machine

2.12 Water-Using Systems

There are several restrooms with toilets, urinals, and sinks. Faucet flow rates are at 2.2 gallons per minute (gpm) or higher.

Faucet Aerators

Faucet Aerators

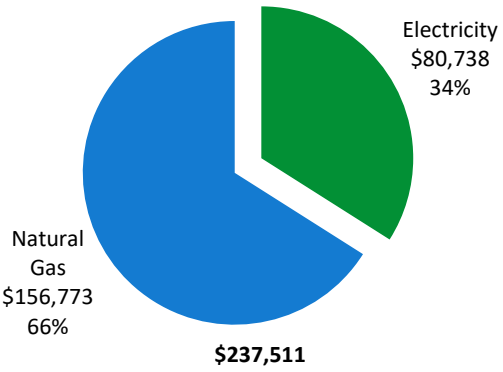
Faucet Aerators

Faucet Aerators

3 Energy Use and Costs

Twelve months of utility billing data are used to develop annual energy consumption and cost data. This information creates a profile of the annual energy consumption and energy costs.

Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	2,834,022 kWh	$80,738
Natural Gas	370,525 Therms	$156,773
Total		**$237,511**



An energy balance identifies and quantifies energy use in your various building systems. This can highlight areas with the most potential for improvement. This energy balance was developed using calculated energy use for each of the end uses noted in the figure.

The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated energy use is then compared to the historical energy use and the initial inputs are revised, as necessary, to balance the calculated energy use to the historical energy use.

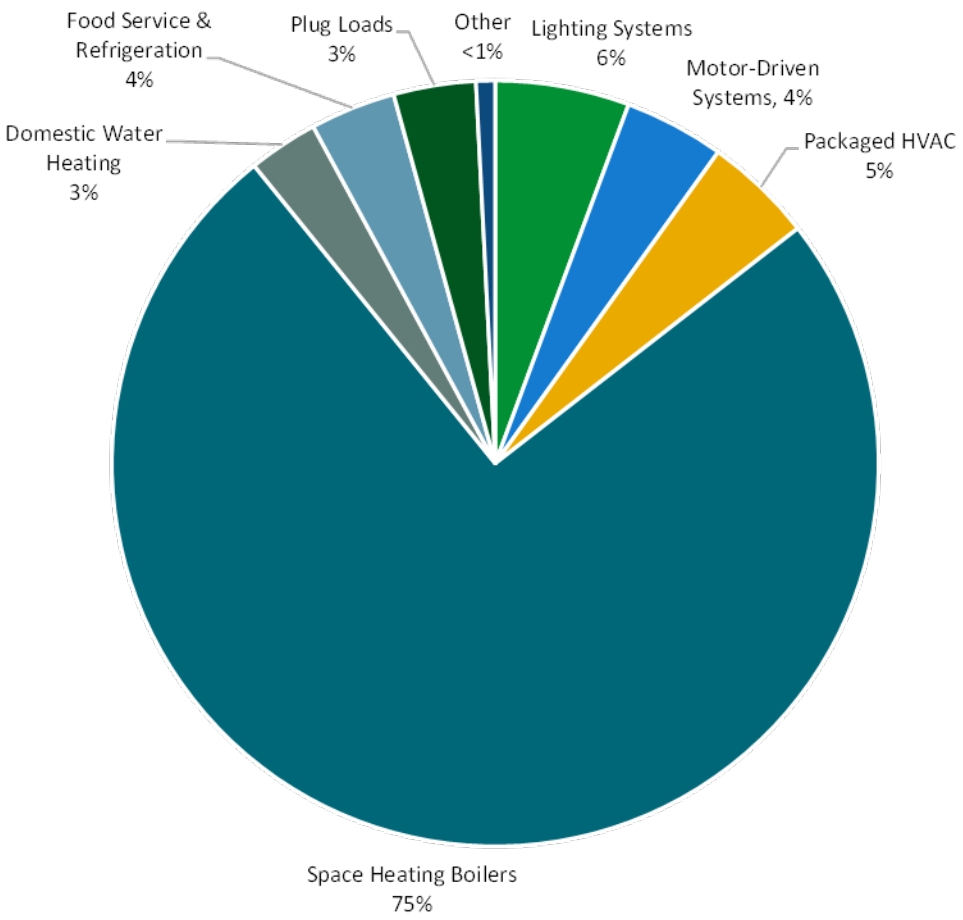
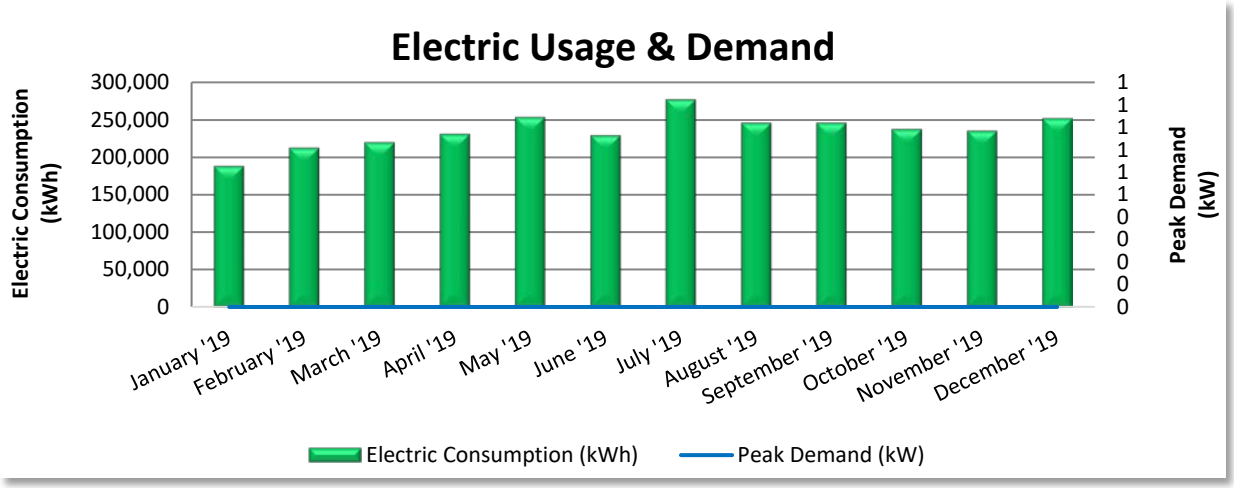


Figure 5 - Energy Balance

3.1 Electricity

PSE&G delivers electricity under rate class High Tension Service (HTS), along with the cogeneration plant.



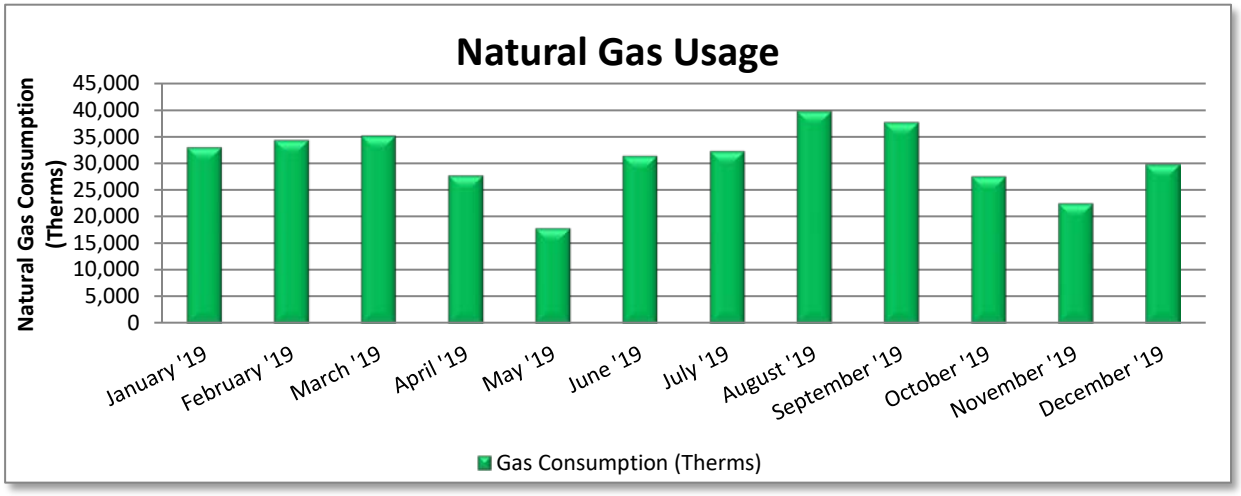
Electric Billing Data						
Period Ending	**Days in Period**	**Electric Usage (kWh)**	**Demand (kW)**	**Demand Cost**	**Total Electric Cost**	**TRC Estimated Usage?**
1/28/19	31	188,752	0	$0	$4,119	Yes
2/28/19	31	213,038	0	$0	$5,242	Yes
3/28/19	28	220,383	0	$0	$4,791	Yes
4/28/19	31	231,547	0	$0	$5,212	Yes
5/29/19	31	254,297	0	$0	$9,377	Yes
6/27/19	29	229,778	0	$0	$7,302	Yes
7/29/19	32	277,430	0	$0	$10,000	Yes
8/27/19	29	246,420	0	$0	$6,996	Yes
9/26/19	30	246,286	0	$0	$7,661	Yes
10/25/19	29	237,999	0	$0	$6,605	Yes
11/25/19	31	235,739	0	$0	$5,696	Yes
12/11/19	33	252,353	0	$0	$7,738	Yes
Totals	**365**	**2,834,022**	**0**	**$0**	**$80,738**	
Annual	**365**	**2,834,022**	**0**	**$0**	**$80,738**	

Notes:

- Electric data has been estimated based on a campus wide approach and utilization of sub metered data. Please refer to the Power House/Cogen Building report for details regarding utility baseline and campus building utility desegregation.
- The peak demand for this facility was unavailable because the building is served with electricity from the master meter.
- The average purchased electric cost over the past 12 months was $0.147/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.
- Effectively all of the electricity generated on-site is used on-site.

3.2 Natural Gas

PSE&G delivers natural gas for the main boiler meter under rate class TSGNF.



Gas Billing Data				
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**	**TRC Estimated Usage?**
1/31/19	31	33,124	12,427	Yes
2/28/19	28	34,440	16,388	Yes
3/31/19	31	35,287	15,839	Yes
4/30/19	30	27,866	11,666	Yes
5/31/19	31	17,928	7,755	Yes
6/30/19	30	31,484	13,580	Yes
7/31/19	31	32,426	13,108	Yes
8/31/19	31	39,890	15,622	Yes
9/30/19	30	37,837	15,148	Yes
10/31/19	31	27,648	11,807	Yes
11/30/19	30	22,637	9,962	Yes
12/31/19	31	29,958	13,471	Yes
Totals	**365**	**370,525**	**$156,773**	
Annual	**365**	**370,525**	**$156,773**	

Notes:

- Natural gas data has been estimated based on a campus wide approach. Please refer to the Power House/Cogen Building report for details regarding the utility baseline and campus building utility desegregation analysis.
- The average gas cost for the past 12 months is $0.423/therm, which is the blended rate used throughout the analysis.
- A supplemental gas meter was found during the site visit; however, we cannot locate the billing information for this meter. It appears that this meter serves the food service equipment which accounts for approximately 3% of the building allocated natural gas use.

3.3 Benchmarking

Your building was benchmarked using the United States Environmental Protection Agency's (EPA) *Portfolio Manager®* software. Benchmarking compares your building's energy use to that of similar buildings across the country, while neutralizing variations due to location, occupancy, and operating hours. Some building types can be scored with a 1-100 ranking of a building's energy performance relative to the national building market. A score of 50 represents the national average and a score of 100 is best.

This ENERGY STAR® benchmarking score provides a comprehensive snapshot of your building's energy performance. It assesses the building's physical assets, operations, and occupant behavior, which is compiled into a quick and easy-to-understand score.

Benchmarking Score	**N/A**

Due to its unique characteristics, this building type is not able to receive a benchmarking score. This report contains suggestions about how to improve building performance and reduce energy costs.

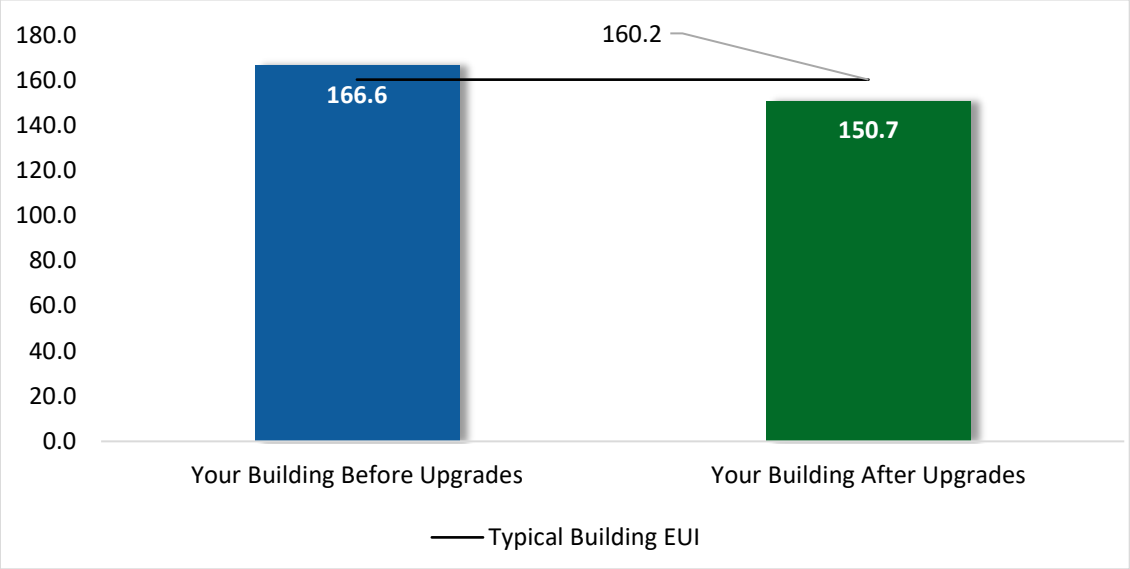


Figure 6 - Energy Use Intensity Comparison[3]

Energy use intensity (EUI) measures energy consumption per square foot and is the standard metric for comparing buildings' energy performance. A lower EUI means better performance and less energy consumed. A number of factors can cause a building to vary from the "typical" energy usage. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and occupant behavior all contribute to a building's energy use and the benchmarking score.

[3] Based on all evaluated ECMs

Tracking Your Energy Performance

Keeping track of your energy use on a monthly basis is one of the best ways to keep energy costs in check. Update your utility information in Portfolio Manager® regularly, so that you can keep track of your building's performance.

We have created a Portfolio Manager® account for your facility and we have already entered the monthly utility data shown above for you. Account login information for your account will be sent via email.

Free online training is available to help you use ENERGY STAR® Portfolio Manager® to track your building's performance at: https://www.energystar.gov/buildings/training.

For more information on ENERGY STAR® and Portfolio Manager®, visit their website[4].

[4] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1.

4 ENERGY CONSERVATION MEASURES

The goal of this audit report is to identify and evaluate potential energy efficiency improvements, provide information about the cost effectiveness of those improvements, and recognize potential financial incentives from NJBPU. Most energy conservation measures have received preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is typically sufficient to demonstrate project cost-effectiveness and help prioritize energy measures.

Calculations of energy use and savings are based on the current version of the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings*, which is approved by the NJBPU. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances.

Operation and maintenance costs for the proposed new equipment will generally be lower than the current costs for the existing equipment—especially if the existing equipment is at or past its normal useful life. We have conservatively assumed there to be no impact on overall maintenance costs over the life of the equipment.

Financial incentives are based on the current NJCEP prescriptive SmartStart program. A higher level of investigation may be necessary to support any SmartStart Custom, Pay for Performance, or Direct Install incentive applications. Some measures and proposed upgrades may be eligible for higher incentives than those shown below through other NJCEP programs described in a following section of this report.

For a detailed list of the locations and recommended energy conservation measures for all inventoried equipment, see **Appendix A: Equipment Inventory & Recommendations.**

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**401,739**	**57.5**	**-84**	**$58,749**	**$114,256**	**$25,537**	**$88,719**	**1.5**	**394,757**
ECM 1	Install LED Fixtures	Yes	678	0.0	0	$100	$509	$50	$459	4.6	683
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	Yes	867	0.5	0	$127	$756	$110	$646	5.1	852
ECM 3	Retrofit Fixtures with LED Lamps	Yes	400,193	57.0	-83	$58,522	$112,991	$25,377	$87,614	1.5	393,222
Lighting Control Measures			**95,406**	**12.2**	**-20**	**$13,951**	**$197,095**	**$14,135**	**$182,960**	**13.1**	**93,737**
ECM 4	Install Occupancy Sensor Lighting Controls	No	61,472	9.4	-13	$8,989	$180,670	$3,765	$176,905	19.7	60,397
ECM 5	Install High/Low Lighting Controls	Yes	33,934	2.8	-7	$4,962	$16,425	$10,370	$6,055	1.2	33,341
Variable Frequency Drive (VFD) Measures			**224,715**	**25.1**	**0**	**$33,060**	**$402,564**	**$13,750**	**$388,814**	**11.8**	**226,287**
ECM 6	Install VFDs on Constant Volume (CV) Fans	Yes	116,375	17.2	0	$17,121	$40,560	$5,675	$34,885	2.0	117,189
ECM 7	Install VFDs on Heating Water Pumps	No	66,530	4.9	0	$9,788	$192,309	$4,400	$187,909	19.2	66,996
ECM 8	Install VFDs on Kitchen Hood Fan Motors	Yes	2,426	0.4	0	$357	$3,391	$75	$3,316	9.3	2,443
ECM 9	Install VFDs on Water Supply Pump	No	39,384	2.6	0	$5,794	$166,305	$3,600	$162,705	28.1	39,659
Unitary HVAC Measures			**131,551**	**30.3**	**0**	**$19,353**	**$170,784**	**$14,898**	**$155,886**	**8.1**	**132,471**
ECM 10	Install High Efficiency Air Conditioning Units	Yes	131,551	30.3	0	$19,353	$170,784	$14,898	$155,886	8.1	132,471
Domestic Water Heating Upgrade			**0**	**0.0**	**332**	**$1,403**	**$5,012**	**$2,796**	**$2,216**	**1.6**	**38,832**
ECM 11	Install Low-Flow DHW Devices	Yes	0	0.0	332	$1,403	$5,012	$2,796	$2,216	1.6	38,832
Food Service & Refrigeration Measures			**14,434**	**1.7**	**0**	**$2,124**	**$7,316**	**$710**	**$6,606**	**3.1**	**14,535**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	6,160	0.8	0	$906	$4,246	$560	$3,686	4.1	6,203
ECM 13	Replace Refrigeration Equipment	Yes	3,902	0.4	0	$574	$2,150	$0	$2,150	3.7	3,929
ECM 14	Vending Machine Control	Yes	4,372	0.5	0	$643	$920	$150	$770	1.2	4,403
Custom Measures			**53,022**	**0.0**	**1,084**	**$12,386**	**$49,100**	**$0**	**$49,100**	**4.0**	**180,302**
ECM 15	Installation of an Energy Management System	Yes	24,681	0.0	713	$6,649	$40,000	$0	$40,000	6.0	108,380
ECM 16	Sub Metering	Yes	28,340	0.0	371	$5,737	$9,100	$0	$9,100	1.6	71,922
TOTALS			**920,866**	**126.7**	**1,312**	**$141,026**	**$946,127**	**$71,826**	**$874,301**	**6.2**	**1,080,920**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 7 – All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**401,739**	**57.5**	**-84**	**$58,749**	**$114,256**	**$25,537**	**$88,719**	**1.5**	**394,757**
ECM 1	Install LED Fixtures	678	0.0	0	$100	$509	$50	$459	4.6	683
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	867	0.5	0	$127	$756	$110	$646	5.1	852
ECM 3	Retrofit Fixtures with LED Lamps	400,193	57.0	-83	$58,522	$112,991	$25,377	$87,614	1.5	393,222
Lighting Control Measures		**33,934**	**2.8**	**-7**	**$4,962**	**$16,425**	**$10,370**	**$6,055**	**1.2**	**33,341**
ECM 5	Install High/Low Lighting Controls	33,934	2.8	-7	$4,962	$16,425	$10,370	$6,055	1.2	33,341
Variable Frequency Drive (VFD) Measures		**118,801**	**17.6**	**0**	**$17,478**	**$43,951**	**$5,750**	**$38,201**	**2.2**	**119,631**
ECM 6	Install VFDs on Constant Volume (CV) Fans	116,375	17.2	0	$17,121	$40,560	$5,675	$34,885	2.0	117,189
ECM 8	Install VFDs on Kitchen Hood Fan Motors	2,426	0.4	0	$357	$3,391	$75	$3,316	9.3	2,443
Unitary HVAC Measures		**131,551**	**30.3**	**0**	**$19,353**	**$170,784**	**$14,898**	**$155,886**	**8.1**	**132,471**
ECM 10	Install High Efficiency Air Conditioning Units	131,551	30.3	0	$19,353	$170,784	$14,898	$155,886	8.1	132,471
Domestic Water Heating Upgrade		**0**	**0.0**	**332**	**$1,403**	**$5,012**	**$2,796**	**$2,216**	**1.6**	**38,832**
ECM 11	Install Low-Flow DHW Devices	0	0.0	332	$1,403	$5,012	$2,796	$2,216	1.6	38,832
Food Service & Refrigeration Measures		**14,434**	**1.7**	**0**	**$2,124**	**$7,316**	**$710**	**$6,606**	**3.1**	**14,535**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	6,160	0.8	0	$906	$4,246	$560	$3,686	4.1	6,203
ECM 13	Replace Refrigeration Equipment	3,902	0.4	0	$574	$2,150	$0	$2,150	3.7	3,929
ECM 14	Vending Machine Control	4,372	0.5	0	$643	$920	$150	$770	1.2	4,403
Custom Measures		**53,022**	**0.0**	**1,084**	**$12,386**	**$49,100**	**$0**	**$49,100**	**4.0**	**180,302**
ECM 15	Installation of an Energy Management System	24,681	0.0	713	$6,649	$40,000	$0	$40,000	6.0	108,380
ECM 16	Sub Metering	28,340	0.0	371	$5,737	$9,100	$0	$9,100	1.6	71,922
TOTALS		**753,480**	**109.9**	**1,325**	**$116,455**	**$406,843**	**$60,061**	**$346,783**	**3.0**	**913,869**

* - All incentives presented in this table are based on NJ SmartStart equipment incentives and assume proposed equipment meets minimum performance criteria for that program.

** - Simple Payback Period is based on net measure costs (i.e. after incentives).

Figure 8 – Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**401,739**	**57.5**	**-84**	**$58,749**	**$114,256**	**$25,537**	**$88,719**	**1.5**	**394,757**
ECM 1	Install LED Fixtures	678	0.0	0	$100	$509	$50	$459	4.6	683
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	867	0.5	0	$127	$756	$110	$646	5.1	852
ECM 3	Retrofit Fixtures with LED Lamps	400,193	57.0	-83	$58,522	$112,991	$25,377	$87,614	1.5	393,222

When considering lighting upgrades, we suggest using a comprehensive design approach that simultaneously upgrades lighting fixtures and controls to maximize energy savings and improve occupant lighting. Comprehensive design will also consider appropriate lighting levels for different space types to make sure that the right amount of light is delivered where needed. If conversion to LED light sources are proposed, we suggest converting all of a specific lighting type (e.g. linear fluorescent) to LED lamps to minimize the number of lamp types in use at the facility, which should help reduce future maintenance costs.

ECM 1: Install LED Fixtures

Replace existing fixtures containing HID, fluorescent, or incandescent lamps with new LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

In some cases, HID fixtures can be retrofit with screw-based LED lamps. Replacing an existing HID fixture with a new LED fixture will generally provide better overall lighting optics; however, replacing the HID lamp with a LED screw-in lamp is typically a less expensive retrofit. We recommend you work with your lighting contractor to determine which retrofit solution is best suited to your needs and will be compatible with the existing fixtures.

Maintenance savings may also be achieved since LED lamps last longer than other light sources and therefore do not need to be replaced as often.

Affected building areas: exterior fixtures.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Retrofit fluorescent fixtures by removing the fluorescent tubes and ballasts and replacing them with LED tubes and LED drivers (if necessary), which are designed to be used in retrofitted fluorescent fixtures.

The measure uses the existing fixture housing but replaces the electric components with more efficient lighting technology which use less power than other lighting technologies but provides equivalent lighting output. Maintenance savings may also be achieved since LED tubes last longer than fluorescent tubes and therefore do not need to be replaced as often.

Affected building areas: all areas with fluorescent fixtures with T12 tubes.

ECM 3: Retrofit Fixtures with LED Lamps

Replace fluorescent and incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies.

This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space. Maintenance savings may also be available, as longer-lasting LEDs lamps will not need to be replaced as often as the existing lamps.

Affected building areas: all areas with fluorescent fixtures with T8 tubes, CFL, and incandescent lamps.

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**95,406**	**12.2**	**-20**	**$13,951**	**$197,203**	**$14,209**	**$182,994**	**13.1**	**93,737**
ECM 4	Install Occupancy Sensor Lighting Controls	61,472	9.4	-13	$8,989	$180,778	$3,779	$176,999	19.7	60,397
ECM 5	Install High/Low Lighting Controls	33,934	2.8	-7	$4,962	$16,425	$10,430	$5,995	1.2	33,341

Lighting controls reduce energy use by turning off or lowering lighting fixture power levels when not in use. A comprehensive approach to lighting design should upgrade the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 4: Install Occupancy Sensor Lighting Controls

We evaluated installing occupancy sensors to control lighting fixtures in areas that are frequently unoccupied, even for short periods. For most spaces, we recommend that lighting controls use dual technology sensors, which reduce the possibility of lights turning off unexpectedly.

Occupancy sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Most occupancy sensor lighting controls allow users to manually turn fixtures on/off, as needed. Some controls can also provide dimming options.

A vacancy sensor turns the lights off when the space is not occupied but differs slightly from an occupancy sensor in that it does not automatically turn the lights on when the space is reoccupied. It requires a manual button press by the occupant to engage the lighting systems. Vacancy sensing maximizes the energy savings from the sensor because it's not always necessary to turn lights on when you walk into a room. Vacancy sensors should be used in cases where occupants are less likely to turn the lights on when temporarily entering a space, when adequate day light is available, or when lighting from adjacent spaces or emergency systems is adequate for the task at hand. Application examples for vacancy sensors may include dorm residential spaces and common areas such as conference rooms.

Occupancy sensors can be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are best suited to single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in large spaces, locations without local switching, and where wall switches are not in the line-of-sight of the main work area.

This measure provides energy savings by reducing the lighting operating hours.

While occupancy sensors may be cost effective in a few building areas, such as common larger common spaces, the relatively low use and limited power draw of fixtures in most areas, including dorm rooms, tends to make the project less cost effective overall.

Affected building areas: offices, lobbies, dorm rooms, and laundry rooms.

ECM 5: Install High/Low Lighting Controls

Install occupancy sensors to provide dual level lighting control for lighting fixtures in spaces that are infrequently occupied but may require some level of continuous lighting for safety or security reasons.

Lighting fixtures with these controls operate at default low levels when the area is unoccupied to provide minimal lighting to meet security or safety code requirements for egress. Sensors detect occupancy using ultrasonic and/or infrared sensors. When an occupant enters the space, the lighting fixtures switch to full lighting levels. Fixtures automatically switch back to low level after a predefined period of vacancy. In parking lots and parking garages with significant ambient lighting, this control can sometimes be combined with photocell controls to turn the lights off when there is sufficient daylight.

The controller lowers the light level by dimming the fixture output. Therefore, the controlled fixtures need to have a dimmable ballast or driver. This will need to be considered when selecting retrofit lamps and bulbs for the areas proposed for high/low control.

This measure provides energy savings by reducing the light fixture power draw when reduced light output is appropriate.

Affected building areas: hallways, stairwells, and parking garage ceiling mount fixtures.

For this type of measure the occupancy sensors will generally be ceiling or fixture mounted. Sufficient sensor coverage must be provided to ensure that lights turn on in each area as an occupant approaches.

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**224,715**	**25.1**	**0**	**$33,060**	**$402,564**	**$13,750**	**$388,814**	**11.8**	**226,287**
ECM 6	Install VFDs on Constant Volume (CV) Fans	116,375	17.2	0	$17,121	$40,560	$5,675	$34,885	2.0	117,189
ECM 7	Install VFDs on Heating Water Pumps	66,530	4.9	0	$9,788	$192,309	$4,400	$187,909	19.2	66,996
ECM 8	Install VFDs on Kitchen Hood Fan Motors	2,426	0.4	0	$357	$3,391	$75	$3,316	9.3	2,443
ECM 9	Install VFDs on Water Supply Pump	39,384	2.6	0	$5,794	$166,305	$3,600	$162,705	28.1	39,659

Variable frequency drives control motors for fans, pumps, and process equipment based on the actual output required of the driven equipment. Energy savings result from more efficient control of motor energy usage when equipment operates at partial load. The magnitude of energy savings depends on the estimated amount of time that the motor would operate at partial load. For equipment with proposed VFDs, we have included replacing the controlled motor with a new inverter duty rated motor to conservatively account for the cost of an inverter duty rated motor.

ECM 6: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control constant volume fan motor speeds. This converts a constant-volume, single-zone air handling system into a variable-air-volume (VAV) system. A separate VFD is usually required to control the return fan motor or dedicated exhaust fan motor if the air handler has one.

Zone thermostats signal the VFD to adjust fan speed to maintain the appropriate temperature in the zone, while maintaining a constant supply air temperature.

For air handlers with direct expansion (DX) cooling systems, the minimum air flow across the cooling coil required to prevent the coil from freezing must be determined during the final project design. The control system programming should maintain the minimum air flow whenever the compressor is operating. Prior to implementation, verify minimum fan speed in cooling mode with the manufacturer. Note that savings will vary depending on the operating characteristics of each AHU.

Energy savings result from reducing the fan speed (and power) when conditions allow for reduced air flow.

Affected air handlers: AHU 1-3.

ECM 7: Install VFDs on Heating Water Pumps

We evaluated installing variable frequency drives (VFD) to control heating water pumps. Two-way valves must serve the hot water coils and the hot water loop must have a differential pressure sensor installed. If three-way valves or a bypass leg are used in the hot water distribution, they will need to be modified when this measure is implemented. As the hot water valves close, the differential pressure increases and the VFD modulates the pump speed to maintain a differential pressure setpoint.

Energy savings result from reducing pump motor speed (and power) as hot water valves close. The magnitude of energy savings is based on the estimated amount of time that the system will operate at reduced load.

Affected pumps: 7.5 hp HWPs in Wolfe and 15 hp HWPs in Travers.

ECM 8: Install VFDs on Kitchen Hood Fan Motors

Install VFDs and sensors to control the kitchen hood fan motor(s). The air flow of the hood is varied based on two key inputs: temperature and smoke/cooking fumes. The VFD controls the amount of exhaust (and kitchen make-up air) based on temperature—the lower the temperature the lower the flow. If the optic sensor is triggered by smoke or cooking fumes, the speed of the fan ramps up to 100%.

Energy savings result from reducing the hood fan speed (and power) when conditions allow for reduced air flow.

ECM 9: Install VFDs on Water Supply Pump

We evaluated installing VFDs to control water supply pumps. Since water supply systems become an open system whenever and end-use valve or fixture is opened the VFD will need to be controlled to maintain sufficient pressure in the distribution system to deliver water to the furthest point in the system.

Energy savings result from reducing the pump speed during low demand periods. Ensure that your control system includes the sensors and inputs required to optimize water flow in your water supply.

Affected pumps: four 5.0 hp domestic hot water circulating pumps.

4.4 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**131,551**	**30.3**	**0**	**$19,353**	**$170,784**	**$14,898**	**$155,886**	**8.1**	**132,471**
ECM 10	Install High Efficiency Air Conditioning Units	131,551	30.3	0	$19,353	$170,784	$14,898	$155,886	8.1	132,471

ECM 10: Install High Efficiency Air Conditioning Units

Replace standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. The magnitude of energy savings for this measure depends on the relative efficiency of the older unit versus the new high efficiency unit, the average cooling and heating load and the estimated annual operating hours.

Affected units: three condensing units located on roof serving AHU 1-3.

4.5 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**0**	**0.0**	**332**	**$1,403**	**$5,012**	**$2,796**	**$2,216**	**1.6**	**38,832**
ECM 11	Install Low-Flow DHW Devices	0	0.0	332	$1,403	$5,012	$2,796	$2,216	1.6	38,832

ECM 11: Install Low-Flow DHW Devices

Install low-flow devices to reduce overall hot water demand. The following low flow devices are recommended to reduce hot water usage:

Device	Flow Rate
Faucet aerators (lavatory)	0.5 gpm
Faucet aerator (kitchen)	1.5 gpm
Showerhead	2.0 gpm
Pre-rinse spray valve (kitchen)	1.28 gpm

Low-flow devices reduce the overall water flow from the fixture, while still providing adequate pressure for washing.

Additional cost savings may result from reduced water usage.

4.6 Food Service & Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**14,434**	**1.7**	**0**	**$2,124**	**$7,316**	**$710**	**$6,606**	**3.1**	**14,535**
ECM 12	Refrigerator/Freezer Case Electrically Commutated Motors	6,160	0.8	0	$906	$4,246	$560	$3,686	4.1	6,203
ECM 13	Replace Refrigeration Equipment	3,902	0.4	0	$574	$2,150	$0	$2,150	3.7	3,929
ECM 14	Vending Machine Control	4,372	0.5	0	$643	$920	$150	$770	1.2	4,403

ECM 12: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor (PSC) motors with electronically commutated (EC) motors in walk-in coolers and freezers. Fractional horsepower EC motors are significantly more efficient than mechanically commutated, brushed motors, particularly at low speeds or partial load. By using variable-speed technology, EC motors can optimize fan usage. Because these motors are brushless and use DC power, losses due to friction and phase shifting are eliminated.

Savings for this measure consider both the increased efficiency of the motor as well as the reduction in refrigeration load due to motor heat loss.

ECM 13: Replace Refrigeration Equipment

Replace existing freezer chest with new ENERGY STAR® rated equipment. The energy savings associated with this measure come from reduced energy usage, due to more efficient technology, and reduced run times.

ECM 14: Vending Machine Control

Vending machines operate continuously, even during unoccupied hours. Install occupancy sensor controls to reduce energy use. These controls power down vending machines when the vending machine area has been vacant for some time, and they power up the machines at necessary regular intervals or when the surrounding area is occupied. Energy savings are dependent on the vending machine and activity level in the area surrounding the machines.

4.7 Custom Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Custom Measures		**53,022**	**0.0**	**1,084**	**$12,386**	**$49,100**	**$0**	**$49,100**	**4.0**	**180,302**
ECM 15	Installation of an Energy Management System	24,681	0.0	713	$6,649	$40,000	$0	$40,000	6.0	108,380
ECM 16	Sub Metering	28,340	0.0	371	$5,737	$9,100	$0	$9,100	1.6	71,922

ECM 15: Installation of an Energy Management System

Most larger facilities have some type of energy management system (EMS) which provides for centralized, remote control and monitoring of HVAC equipment and sometimes lighting or other building systems. An EMS utilizes a system of temperature and pressure sensors that obtain feedback about field conditions and provide signals to control systems that adjust HVAC system operation for optimal functioning. Thirty years ago, most control systems were pneumatic systems driven by compressed air, with pneumatic thermostats and air driven actuators for valves and dampers. Pneumatic controls have largely been replaced by direct digital control (DDC) systems, but many pneumatic systems remain. Contemporary DDC systems afford tighter controls and enhanced monitoring and trending capabilities as compared to the older systems.

Based on our survey, it appears that the installation or augmentation of an EMS at your site could increase the efficiency of your building HVAC system operation.

A controls upgrade would enable automated equipment "start" and "stop" times, temperature setpoints, lockouts and deadbands to be programmed remotely using a graphic interface. Controls can be configured to optimize ventilation and outside air intake by adjusting economizer position, damper function and fan speed. Existing chilled and hot water distribution system controls are typically "tied in", including associated pumps and valves. Coordinated control of HVAC systems is dependent on a network of sensors and status points. A comprehensive building control system provides monitoring and control for all HVAC systems so operators can adjust system programming for optimal comfort and energy savings.

It is recommended that an HVAC engineer or contractor who specializes in energy management systems be contacted for a detailed evaluation and implementation costs. For the purposes of this report, the potential energy savings and measure costs were estimated based on industry standards and previous project experience. Further analysis should be conducted for the feasibility of this measure. This is not an investment grade analysis nor should be used as a basis for design and construction.

A high-level evaluation of potential savings and costs is provided for demonstration purposes only. It is a screening evaluation for the potential in installing an EMS. Based on industry standards and previous project experience, the potential energy savings may be up to 20% of existing HVAC energy use. The average cost for installing and EMS may be between $2 and $4 per square foot. Actual savings and costs will need to be outlined by the specific contractor engaged to implement the system. For the purposes of this report, we have conservatively estimated savings to be 2% of the HVAC energy consumption baseline.

ECM 16: Sub Metering

Facility staff expressed interest in utility sub metering key buildings which are currently served by a master meter and the central plant. Utility submeters alone do not save energy, but they are a useful tool under the right circumstances. Utility sub-meters can provide facility staff with real-time energy use data for specific buildings, information that enhances the potential for greater energy management activities. Revenue grade submeters are a tool that allow owners to bill tenants or departments for the energy consumed in the spaces they occupy. Better resolution on building system performance can lead to occupant behavioral changes which often result in reduced energy use.

A high-level evaluation of potential savings and costs is provided for demonstration purposes only. Based on industry standards and case studies, the potential energy savings may be up to 5% of existing energy usage. For the purposes of this report, a conservative assumed savings of 1% was applied to building allocated electrical and natural gas consumption of the sub metered buildings based on the premise of occupant behavioral changes. For this building the following submeters are proposed: smart electric meter and steam flow meter. Meter costs for the evaluation are based on average building use across the campus: smart electric meter $2,400, steam flow meter $6,700. The actual scope of work and implementation costs must be provided by a contractor in the future. This measure is recommended for implementation based on the initial energy and economic results but primarily for enhancing the potential for greater energy management activities.

A whole building maintenance plan will extend equipment life; improve occupant comfort, health, and safety; and reduce energy and maintenance costs.

Operation and maintenance (O&M) plans enhance the operational efficiency of HVAC and other energy intensive systems and could save between 5 to 20 percent of the energy usage in your building without substantial capital investment. A successful plan includes your records of energy usage trends and costs, building equipment lists, current maintenance practices, planned capital upgrades, and incorporates your ideas for improved building operation. Your plan will address goals for energy-efficient operation, provide detail on how to reach the goals, and will outline procedures for measuring and reporting whether goals have been achieved.

You may already be doing some of these things— see our list below for potential additions to your maintenance plan. Be sure to consult with qualified equipment specialists for details on proper maintenance and system operation.

Energy Tracking with ENERGY STAR® Portfolio Manager®

You've heard it before - you can't manage what you don't measure. ENERGY STAR® Portfolio Manager® is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[5] . Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Doors and Windows

Close exterior doors and windows in heated and cooled areas. Leaving doors and windows open leads to a loss of heat during the winter and chilled air during the summer. Reducing air changes per hour (ACH) can lead to increased occupant comfort as well as heating and cooling savings, especially when combined with proper HVAC controls and adequate ventilation.

Window Treatments/Coverings

Use high-reflectivity films or cover windows with shades or shutters to reduce solar heat gain and reduce the load on cooling and heating systems. Older, single pane windows and east or west-facing windows are especially prone to solar heat gain. In addition, use shades or shutters at night during cold weather to reduce heat loss.

Motor Maintenance

Motors have many moving parts. As these parts degrade over time, the efficiency of the motor is reduced. Routine maintenance prevents damage to motor components. Routine maintenance should include cleaning surfaces and ventilation openings on motors to prevent overheating, lubricating moving parts to reduce friction, inspecting belts and pulleys for wear and to ensure they are at proper alignment and

[5] https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager.

tension, and cleaning and lubricating bearings. Consult a licensed technician to assess these and other motor maintenance strategies.

Economizer Maintenance

Economizers can significantly reduce cooling system load. A malfunctioning economizer can increase the amount of heating and mechanical cooling required by introducing excess amounts of cold or hot outside air. Common economizer malfunctions include broken outdoor thermostat or enthalpy control, or dampers that are stuck or improperly adjusted.

Periodic inspection and maintenance will keep economizers working in sync with the heating and cooling system. This maintenance should be part of annual system maintenance, and it should include proper setting of the outdoor thermostat/enthalpy control, inspection of control and damper operation, lubrication of damper connections, and adjustment of minimum damper position.

AC System Evaporator/Condenser Coil Cleaning

Dirty evaporator and condenser coils restrict air flow and restrict heat transfer. This increases the loads on the evaporator and condenser fan and decreases overall cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

HVAC Filter Cleaning and Replacement

Air filters should be checked regularly (often monthly) and cleaned or replaced when appropriate. Air filters reduce indoor air pollution, increase occupant comfort, and help keep equipment operating efficiently. If the building has a building management system, consider installing a differential pressure switch across filters to send an alarm about premature fouling or overdue filter replacement. Over time, filters become less and less effective as particulate buildup increases. Dirty filters also restrict air flow through the air conditioning or heat pump system, which increases the load on the distribution fans.

Ductwork Maintenance

Duct maintenance has two primary goals: keep the ducts clean to avoid air quality problems and seal leaks to save energy. Check for cleanliness, obstructions that block airflow, water damage, and leaks. Ducts should be inspected at least every two years.

The biggest symptoms of clogged air ducts are differing temperatures throughout the building and areas with limited airflow from supply registers. If a particular air duct is clogged, then air flow will only be cut off to some rooms in the building - not all of them. The reduced airflow will make it more difficult for those areas to reach the temperature setpoint which will cause the HVAC system to run longer to cool or heat that area properly. If you suspect clogged air ducts, ensure that all areas in front of supply registers are clear of items that may block or restrict air flow, and check for fire dampers or balancing dampers that have failed closed.

Duct leakage in commercial buildings can account for 5% to 25% of the supply airflow. In the case of rooftop air handlers, duct leakage can occur to the outside of the building wasting conditioned air. Check ductwork for leakage. Eliminating duct leaks can improve ventilation system performance and reduce heating and cooling system operation.

Distribution system losses are dependent on air system temperature, the size of the distribution system, and the level of insulation of the ductwork. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is missing or worn, the system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Refrigeration Equipment Maintenance

Preventative maintenance keeps commercial refrigeration equipment running reliably and efficiently. Commercial refrigerators and freezers are mission-critical equipment that can cost a fortune when they go down. Even when they appear to be working properly, refrigeration units can be consuming too much energy. Have walk-in refrigeration and freezer and other commercial systems serviced at least annually. This practice will allow systems to perform to their highest capabilities and will help identify system issues if they exist.

Maintaining your commercial refrigeration equipment can save between 5 and 10 percent on energy costs. When condenser coils are dirty, your commercial refrigerators and freezers work harder to maintain the temperature inside. Worn gaskets, hinges, door handles or faulty seals cause cold air to leak from the unit, forcing the unit to run longer and use more electricity.

Regular cleaning and maintenance also help your commercial refrigeration equipment to last longer.

Water Conservation

Installing dual flush or low-flow toilets and low-flow/waterless urinals are ways to reduce water use. The EPA WaterSense® ratings for urinals is 0.5 gallons per flush (gpf) and for flush valve toilets is 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

For more information regarding water conservation go to the EPA's WaterSense® website[6] or download a copy of EPA's "WaterSense® at Work: Best Management Practices for Commercial and Institutional Facilities"[7] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Water conservation devices that do not reduce hot water consumption will not provide energy savings at the site level, but they may significantly affect your water and sewer usage costs. Any reduction in water use does however ultimately reduce grid-level electricity use since a significant amount of electricity is used to deliver water from reservoirs to end users.

If the facility has detached buildings with a master water meter for the entire campus, check for unnatural wet areas in the lawn or water seeping in the foundation at water pipe penetrations through the foundation. Periodically check overnight meter readings when the facility is unoccupied, and there is no other scheduled water usage.

Manage irrigation systems to use water more effectively outside the building. Adjust spray patterns so that water lands on intended lawns and plantings and not on pavement and walls. Consider installing an evapotranspiration irrigation controller that will prevent over-watering.

Procurement Strategies

Purchasing efficient products reduces energy costs without compromising quality. Consider modifying your procurement policies and language to require ENERGY STAR® or WaterSense® products where available.

[6] https://www.epa.gov/watersense.

[7] https://www.epa.gov/watersense/watersense-work-0.

6 On-site Generation

You don't have to look far in New Jersey to see one of the thousands of solar electric systems providing clean power to homes, businesses, schools, and government buildings. On-site generation includes both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) technologies that generate power to meet all or a portion of the facility's electric energy needs. Also referred to as distributed generation, these systems contribute to greenhouse gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, which results in improved electric grid reliability through better use of transmission and distribution systems.

Preliminary screenings were performed to determine if an on-site generation measure could be a cost-effective solution for your facility. Before deciding to install an on-site generation system, we recommend conducting a feasibility study to analyze existing energy profiles, siting, interconnection, and the costs associated with the generation project including interconnection costs, departing load charges, and any additional special facilities charges.

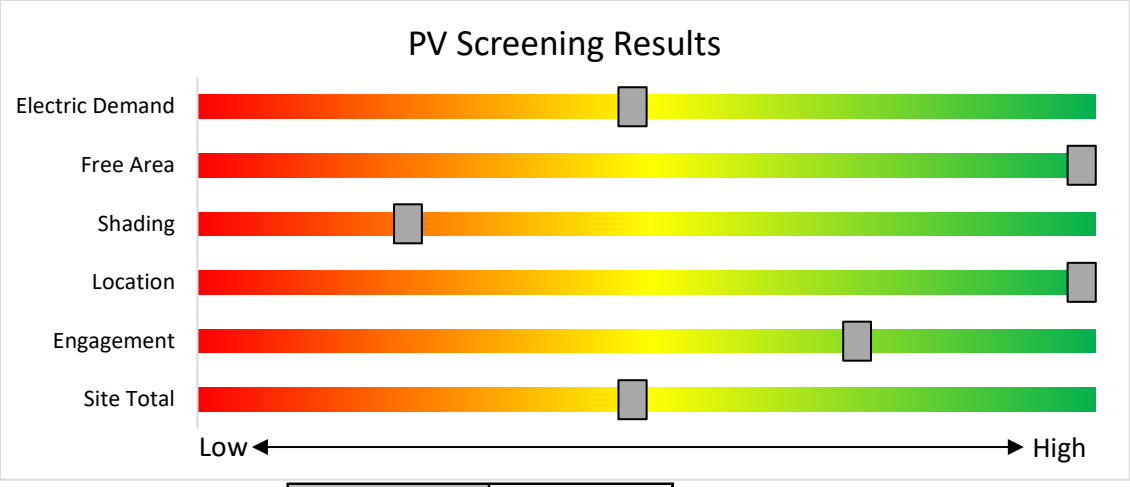
6.1 Solar Photovoltaic

Photovoltaic (PV) panels convert sunlight into electricity. Individual panels are combined into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is then connected to the building's electrical distribution system.

A preliminary screening based on the facility's electric demand, size and location of free area, and shading elements shows that the facility has medium potential for installing a PV array.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the medium potential. A PV array located on the roof may be feasible. If you are interested in pursuing the installation of PV, we recommend conducting a full feasibility study.

The graphic below displays the results of the PV potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.



Potential	Medium	
System Potential	322	kW DC STC
Electric Generation	242,287	kWh/yr
Displaced Cost	$35,640	/yr
Installed Cost	$837,200	

Figure 9 - Photovoltaic Screening

Transition Incentive (TI) Program

The TI program is a bridge between the Legacy SREC Program and a to-be determined Successor Incentive Program. The program is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn TRECs (Transition Incentive Renewable Energy Certificates). The Transition Incentive is structured as a factorized renewable energy certificate. The factors allow the TI Program to provide differentiated financial incentives for different types of solar installation.

Get more information about solar power in New Jersey or find a qualified solar installer who can help you decide if solar is right for your building:

Transition Incentive (TI) Program: https://www.njcleanenergy.com/renewable-energy/programs/transition-incentive-program

- **Basic Info on Solar PV in NJ**: www.njcleanenergy.com/whysolar.
- **NJ Solar Market FAQs**: www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs.
- **Approved Solar Installers in the NJ Market**: www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/?id=60&start=1.

6.2 Combined Heat and Power

Combined heat and power (CHP) generates electricity at the facility and puts waste heat energy to good use. Common types of CHP systems are reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines.

CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for space cooling.

The key criteria used for screening is the amount of time that the CHP system would operate at full load and the facility's ability to use the recovered heat. Facilities with a continuous need for large quantities of waste heat are the best candidates for CHP.

A preliminary screening based on heating and electrical demand, siting, and interconnection shows that the facility has no potential for installing a cost-effective CHP system.

Based on a preliminary analysis, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation. The lack of gas service, low or infrequent thermal load, and lack of space for siting the equipment are the most significant factors contributing to the lack of CHP potential.

The graphic below displays the results of the CHP potential screening conducted as a part of this audit. The position of each slider indicates the potential (potential increases to the right) that each factor contributes to the overall site potential.

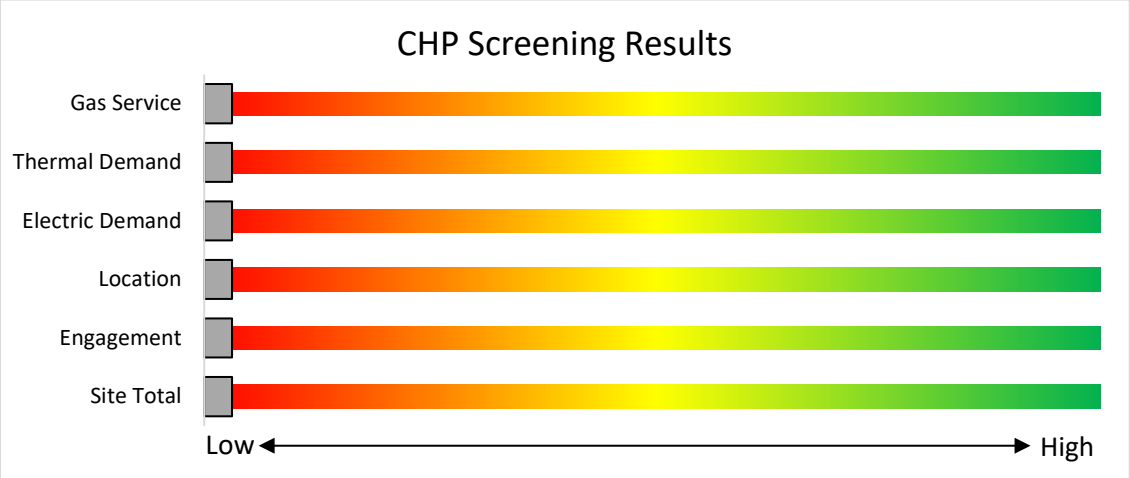


Figure 10 - Combined Heat and Power Screening

Find a qualified firm that specializes in commercial CHP cost assessment and installation: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/

7 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey's Clean Energy Programs can help. Pick the program that works best for you. Incentive programs that may apply to this facility are identified in the Executive Summary. This section provides an overview of currently available New Jersey's Clean Energy Programs.

	SmartStart *Flexibility to install at your own pace*	**Direct Install** *Turnkey installation*	**Pay for Performance** *Whole building upgrades*
Who should use it?	Buildings installing individual measures or small group of measures.	Small to mid-size facilities that can bundle multiple measures together. Average peak demand should be below 200 kW. Not suitable for significant building shell issues.	Mid to large size facilities looking to implement as many measures as possible at one time. Peak demand should be over 200 kW.
How does it work?	Use in-house staff or your preferred contractor.	Pre-approved contractors pass savings along to you via reduced material and labor costs.	Whole-building approach to energy upgrades designed to reduce energy use by at least 15%. The more you save, the higher the incentives.
What are the Incentives?	Fixed incentives for specific energy efficiency measures.	Incentives pay up to 70% of eligible costs, up to $125,000 per project. You pay the remaining 30% directly to the contractor.	Incentives are paid out in three installments. The first installment is meant to help offset the costs of the initial engineering study. The subsequent incentives are paid based on the level of energy savings up to 50% of the total project cost. See Section 7.3 for all incentive details.
How do I participate?	Submit an application for the specific equipment to be installed.	Contact a participating contractor in your region.	Contact a pre-qualified Partner to develop your Energy Reduction Plan and set your energy savings targets.
Take the next step by visiting **www.njcleanenergy.com** for program details, applications, and to contact a qualified contractor.			

7.1 SmartStart

SmartStart offers incentives for installing prescriptive and custom energy efficiency measures at your facility. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades. This program serves most common equipment types and sizes.

SmartStart routinely adds, removes, or modifies incentives from year-to-year for various energy efficient equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers
Electric Unitary HVAC
Gas Cooling
Gas Heating
Gas Water Heating
Ground Source Heat Pumps
Lighting
Lighting Controls
Refrigeration Doors
Refrigeration Controls
Refrigerator/Freezer Motors
Food Service Equipment
Variable Frequency Drives

Incentives

The SmartStart Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type.

SmartStart Custom provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives. Custom incentives are calculated at $0.16/kWh and $1.60/therm based on estimated annual savings. Incentives are capped at 50% of the total installed incremental project cost, or a project cost buy down to a one-year payback (whichever is less). Program incentives are capped at $500,000 per electric account and $500,000 per natural gas account, per fiscal year.

How to Participate

Submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. You can work with your preferred contractor or use internal staff to install measures.

Visit www.njcleanenergy.com/SSB for a detailed program description, instructions for applying, and applications.

7.2 Direct Install

Direct Install is a turnkey program available to existing small to medium-sized facilities with an average peak electric demand that does not exceed 200 kW over the recent 12-month period. You work directly with a pre-approved contractor who will perform a free energy assessment at your facility, identify specific eligible measures, and provide a clear scope of work for installation of selected measures. Energy efficiency measures may include lighting and lighting controls, refrigeration, HVAC, motors, variable speed drives, and controls.

Based on the site building and utility data provided, the facility does not meet the requirements of the current DI program.

Incentives

The program pays up to 70 percent of the total installed cost of eligible measures, up to $125,000 per project. Each entity is limited to incentives up to $250,000 per fiscal year.

How to Participate

To participate in Direct Install, you will need to contact the participating contractor assigned to the region of the state where your facility is located. A complete list of Direct Install program partners is provided on the Direct Install website linked below. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70 percent of eligible costs are covered by the program, subject to program caps and eligibility, while the remaining 30 percent of the cost is paid to the contractor by the customer.

Detailed program descriptions and applications can be found at: www.njcleanenergy.com/DI.

7.3 Pay for Performance - Existing Buildings

Pay for Performance works for larger customers with a peak demand over 200 kW. The minimum installed scope of work must include at least two unique measures that results in at least 15 percent source energy savings, and lighting cannot make up the majority of the savings.

P4P is a generally a good option for medium-to-large sized facilities looking to implement as many measures as possible under a single project to achieve deep energy savings. This program has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program.

For master metered campuses, such as The College of New Jersey, P4P eligibility is evaluated at the campus level. For the purposes of reporting P4P eligibility is being presented at all of the buildings. Final eligibility will be assessed once all of the reports are completed and will be addressed at the Exit Meeting. If the campus does not meet the 15% savings threshold based on measures identified during the LGEA Program process it is possible that additional measures could be identified at a later point in time, for example through further evaluation or the Energy Savings Improvement Program process.

Incentives

Incentives are based on estimated and achieved energy savings ranging from $0.18-$0.22/kWh and $1.80-$2.50/therm, capped at the lesser of 50% total project cost, or $1 million per electric account and $1 million per natural gas account, per fiscal year, not to exceed $2 million per project. An incentive of $0.15/square foot is also available to offset the cost of developing the Energy Reduction Plan (see below) contingent on the project moving forward with measure installation.

How to Participate

Contact one of the pre-approved consultants and contractors (“Partners”). Under direct contract to you, they will help further evaluate the measures identified in this report through development of the energy reduction plan), assist you in implementing selected measures, and verify actual savings one year after the installation. Your Partner will also help you apply for incentives.

Approval of the final scope of work is required by the program prior to installation. Installation can be done by the contractor of your choice (some P4P Partners are also contractors) or by internal staff, but the Partner remains involved throughout construction to ensure compliance with the program requirements.

Detailed program descriptions, instructions for applying, applications and list of Partners can be found at www.njcleanenergy.com/P4P.

7.4 Combined Heat and Power

The Combined Heat & Power (CHP) program provides incentives for eligible CHP or waste heat to power (WHP) projects. Eligible CHP or WHP projects must achieve an annual system efficiency of at least 65% (lower heating value, or LHV), based on total energy input and total utilized energy output. Mechanical energy may be included in the efficiency evaluation.

Incentives

Eligible Technologies	Size (Installed Rated Capacity)[1]	Incentive ($/kW)	% of Total Cost Cap per Project[3]	$ Cap per Project[3]
Powered by non-renewable or renewable fuel source[4]	≤500 kW	$2,000	30-40%[2]	$2 million
Gas Internal Combustion Engine	>500 kW - 1 MW	$1,000		
Gas Combustion Turbine	> 1 MW - 3 MW	$550	30%	$3 million
Microturbine Fuel Cells with Heat Recovery	>3 MW	$350		
Waste Heat to Power*	<1 MW	$1,000	30%	$2 million
	> 1MW	$500		$3 million

*Waste Heat to Power: Powered by non-renewable fuel source, heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine).

Check the NJCEP website for details on program availability, current incentive levels, and requirements.

How to Participate

You work with a qualified developer or consulting firm to complete the CHP application. Once the application is approved the project can be installed. Information about the CHP program can be found at www.njcleanenergy.com/CHP.

7.5 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) serves New Jersey's government agencies by financing energy projects. An ESIP is a type of performance contract, whereby school districts, counties, municipalities, housing authorities and other public and state entities enter in to contracts to help finance building energy upgrades. Annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive for the life of the contract.

ESIP provides government agencies in New Jersey with a flexible tool to improve and reduce energy usage with minimal expenditure of new financial resources. NJCEP incentive programs described above can also be used to help further reduce the total project cost of eligible measures.

How to Participate

This LGEA report is the first step to participating in ESIP. Next, you will need to select an approach for implementing the desired ECMs:

(1) Use an energy services company or "ESCO."

(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.

(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

After adopting a resolution with a chosen implementation approach, the development of the energy savings plan (ESP) can begin. The ESP demonstrates that the total project costs of the ECMs are offset by the energy savings over the financing term, not to exceed 15 years. The verified savings will then be used to pay for the financing.

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Carefully consider all alternatives to develop an approach that best meets your needs. A detailed program descriptions and application can be found at www.njcleanenergy.com/ESIP.

ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you can use NJCEP incentive programs to help further reduce costs when developing the energy savings plan. Refer to the ESIP guidelines at the link above for further information and guidance on next steps.

7.6 Transition Incentive (TI) Program

The TI program is a bridge between the Legacy SREC Program and a to-be determined Successor Incentive Program. The program is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects *must* register their projects prior to the start of construction to establish the project's eligibility to earn TRECs (Transition Incentive Renewable Energy Certificates). The Transition Incentive is structured as a factorized renewable energy certificate. The factors allow the TI Program to provide differentiated financial incentives for different types of solar installations. NJBPU calculates the value of a Transition Renewable Energy Certificate (TREC) by multiplying the base compensation rate ($152/MWh) by the project's assigned factor (i.e. $152 x 0.85 = $129.20/MWh). The TREC factors are defined based on the chart below:

Project Type	Factor
Subsection (t): landfill, brownfield, areas of historic fill	1.00
Grid supply (Subsection (r)) rooftop	1.00
Net metered non-residential rooftop and carport	1.00
Community solar	0.85
Grid supply (Subsection (r)) ground mount	0.60
Net metered residential ground mount	0.60
Net metered residential rooftop and carport	0.60
Net metered non-residential ground mount	0.60

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number, which enables it to generate New Jersey TRECs.

Eligible projects may generate TRECs for 15 years following the commencement of commercial operations (also referred to as the "Transition Incentive Qualification Life"). After 15 years, projects may be eligible for a NJ Class I REC.

TRECs will be used by the identified compliance entities to satisfy a compliance obligation tied to a new Transition Incentive Renewable Portfolio Standard ("TI-RPS"), which will exist in parallel with, and completely separate from, the existing Solar RPS for Legacy SRECs. The TI-RPS is a carve-out of the current Class I RPS requirement. The creation of TRECs is based upon metered generation supplied to PJM-EIS General Attribute Tracking System ("GATS") by the owners of eligible facilities or their agents. GATS would create one TREC for each MWh of energy produced from a qualified facility.

TRECs will be purchased monthly by a TREC Administrator who will allocate the TRECs to the Load Serving Entities (BGS Providers and Third-Party Suppliers) annually based on their market share of retail electricity sold during the relevant Energy Year.

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state's Energy Master Plan. The Transition Incentive Program online portal is now open to new applications effective May 1, 2020. There are instructions on "How and When to Transfer my SRP Registration to the Transition Incentive Program". If you are considering installing solar photovoltaics on your building, visit the following link for more information:

https://www.njcleanenergy.com/renewable-energy/programs/transition-incentive-program

8 PROJECT DEVELOPMENT

Energy conservation measures (ECMs) have been identified for your site and their energy and economic analyses are provided within this LGEA report. The next steps with project development are to set goals and create a comprehensive project plan. The graphic below provides an overview of the process flow for a typical energy efficiency or renewable energy project. We recommend implementing as many ECMs as possible prior to undertaking a feasibility study for a renewable project. The cyclical nature of this process flow demonstrates the ongoing work required to continually improve building energy efficiency over time. If your building(s) scope of work is relatively simple to implement or small in scope, the measurement and verification (M&V) step may not be required. It should be noted through a typical project cycle, there will be changes in costs based on specific scopes of work, contractor selections, design considerations, construction, etc. The estimated costs provided throughout this LGEA report demonstrate the unburdened turn-key material and labor cost only. There will be contingencies and additional costs at the time of implementation. We recommend comprehensive project planning includes the review of multiple bids for project work, incorporate potential operational & maintenance (O&M) cost savings and maximize your incentive potential.

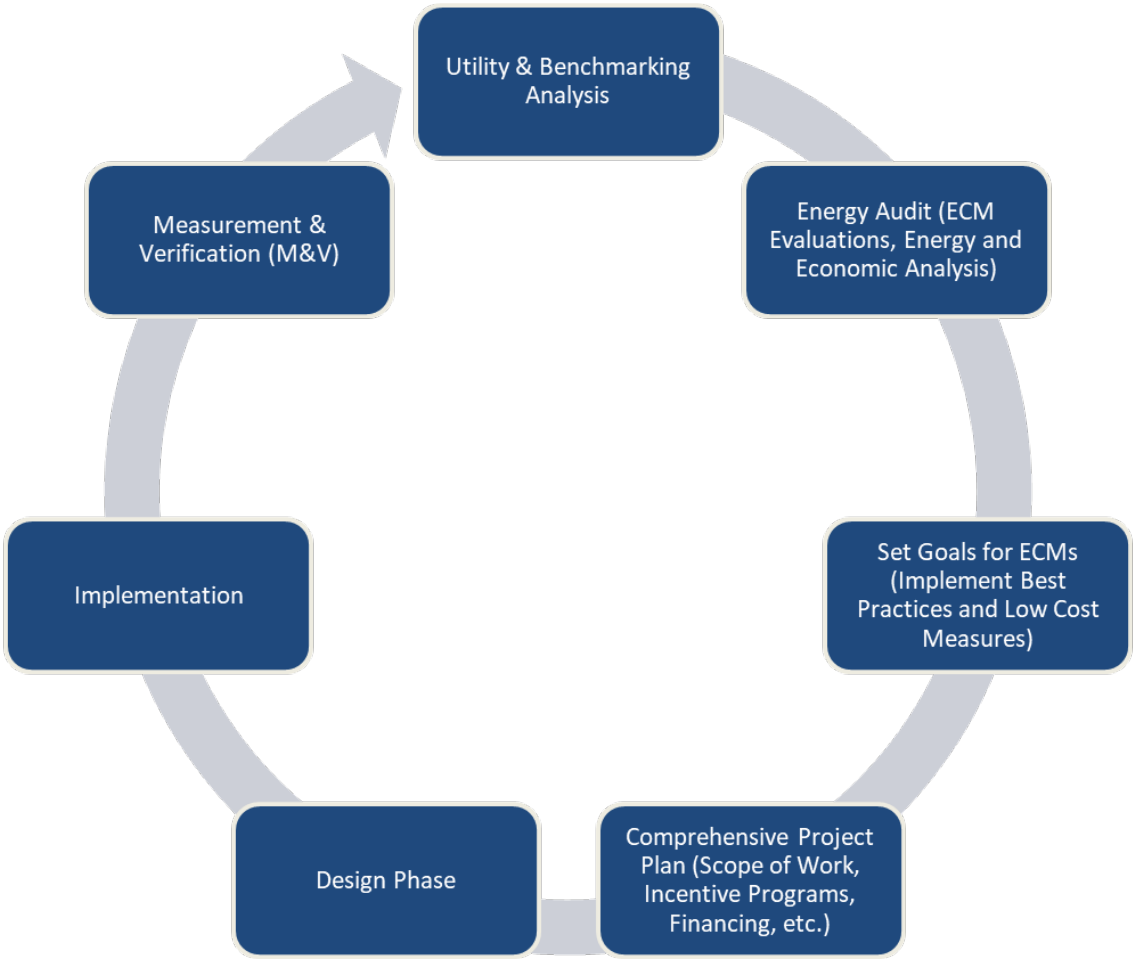


Figure 11 – Project Development Cycle

9 Energy Purchasing and Procurement Strategies

9.1 Retail Electric Supply Options

Energy deregulation in New Jersey has increased energy buyers' options by separating the function of electricity distribution from that of electricity supply. So, though you may choose a different company from which to buy your electric power, responsibility for your facility's interconnection to the grid and repair to local power distribution will still reside with the traditional utility company serving your region.

If your facility is not purchasing electricity from a third-party supplier, consider shopping for a reduced rate from third-party electric suppliers. If your facility already buys electricity from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party electric suppliers is available at the NJBPU website[8].

9.2 Retail Natural Gas Supply Options

The natural gas market in New Jersey is also deregulated. Most customers that remain with the utility for natural gas service pay rates that are market-based and that fluctuate monthly. The utility provides basic gas supply service (BGSS) to customers who choose not to buy from a third-party supplier for natural gas commodity.

A customer's decision about whether to buy natural gas from a retail supplier typically depends on whether a customer prefers budget certainty and/or longer-term rate stability. Customers can secure longer-term fixed prices by signing up for service through a third-party retail natural gas supplier. Many larger natural gas customers may seek the assistance of a professional consultant to assist in their procurement process.

If your facility does not already purchase natural gas from a third-party supplier, consider shopping for a reduced rate from third-party natural gas suppliers. If your facility already purchases natural gas from a third-party supplier, review and compare prices at the end of each contract year.

A list of licensed third-party natural gas suppliers is available at the NJBPU website[9].

[8] www.state.nj.us/bpu/commercial/shopping.html.

[9] www.state.nj.us/bpu/commercial/shopping.html.

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
101	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
101	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
102	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
102	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
103	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
103	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
104	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
104	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
105	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
105	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
106	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
106	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
107	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
107	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
108	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
108	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
109	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
109	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
110	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
110	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
121	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
121	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
121	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
122	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
122	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
123	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
123	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
124	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
124	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
125	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
125	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
126	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
126	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
127	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
127	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
128	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
128	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
129	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
129	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
130	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
130	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
131	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
131	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
133	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
133	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
144B	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.1	351	0	$51	$343	$20	6.3
146L	1	Compact Fluorescent: (2) 26W Double Biaxial Plug-In Lamps	Wall Switch	S	52	3,800	3	Relamp	No	1	LED Lamps: (2) 18.5W Plug-In Lamps	Wall Switch	37	3,800	0.0	63	0	$9	$25	$2	2.5
148/150	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,800	0.0	138	0	$20	$37	$10	1.3
148/150	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,800	3, 4	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,622	0.1	790	0	$115	$434	$80	3.1
152L	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
153	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.1	351	0	$51	$343	$40	5.9
155	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$60	3.9
158	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.1	351	0	$51	$343	$40	5.9
160	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
160	42	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	42	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	1.3	7,372	-2	$1,078	$2,344	$525	1.7
161	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
161	48	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	48	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	1.5	8,425	-2	$1,232	$2,833	$620	1.8
Electrical Room 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	500	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	500	0.0	31	0	$5	$73	$20	11.8
Elevator Machine Room	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	500	3	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.2	163	0	$24	$329	$90	10.0
Front Side Wolf Vestibule	3	LED - Fixtures: Ceiling Mount	Wall Switch	S	9	3,800		None	No	3	LED - Fixtures: Ceiling Mount	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Main Lobby Wolfe	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main Lobby Wolfe	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,500	3	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,500	0.0	163	0	$24	$37	$10	1.1
Main Lobby Wolfe	9	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,500	3, 5	Relamp	Yes	9	LED - Linear Tubes: (4) 4' Lamps	High/Low Control	58	3,105	0.5	3,296	-1	$482	$1,107	$495	1.3
Main Lounge Travers	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main Lounge Travers	2	LED - Fixtures: Decorative Pendant	Wall Switch	S	225	4,500		None	No	2	LED - Fixtures: Decorative Pendant	Wall Switch	225	4,500	0.0	0	0	$0	$0	$0	0.0
Main Lounge Travers	66	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,500	3, 4	Relamp	Yes	66	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,105	2.0	13,718	-3	$2,006	$3,760	$835	1.5
Main Lounge Wolfe	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Main Lounge Wolfe	2	LED - Fixtures: Decorative Pendant	Wall Switch	S	225	4,500		None	No	2	LED - Fixtures: Decorative Pendant	Wall Switch	225	4,500	0.0	0	0	$0	$0	$0	0.0
Main Lounge Wolfe	66	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,500	3, 4	Relamp	Yes	66	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,105	2.0	13,718	-3	$2,006	$3,598	$814	1.4
Middle Hall	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Middle Hall	2	Linear Fluorescent - T8: 3' T8 (25W) - 1L	None	S	27	4,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (1) 3' Lamp	High/Low Control	11	3,105	0.0	196	0	$29	$37	$10	0.9
Middle Hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,105	0.1	416	0	$61	$73	$20	0.9
Middle Hall	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,500	3, 5	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	3,105	0.1	416	0	$61	$73	$20	0.9
Middle Hall	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,500	3, 5	Relamp	Yes	9	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	3,105	0.4	2,806	-1	$410	$943	$450	1.2
Restroom 146	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,800	3	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,800	0.0	207	0	$30	$55	$15	1.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Stairs Side Travers	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	8,760	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	8,760	0.0	540	0	$79	$73	$20	0.7
Stairs Side Travers	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	8,760	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	6,044	0.1	1,134	0	$166	$442	$135	1.9
Stairs Side Wolfe	1	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch		114	8,760	3	Relamp	No	1	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	8,760	0.0	540	0	$79	$73	$20	0.7
Stairs Side Wolfe	3	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch		62	8,760	3, 5	Relamp	Yes	3	LED - Linear Tubes: (2) U-Lamp	High/Low Control	33	6,044	0.1	1,134	0	$166	$442	$135	1.9
Wolfe Alarm Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.2	1,237	0	$181	$562	$115	2.5
Wolfe Dorm Stairs 1	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	8,760	3, 5	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	6,044	0.6	8,497	-2	$1,243	$1,554	$945	0.5
Wolfe Dorm Stairs 2	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	8,760	3, 5	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	6,044	0.6	8,497	-2	$1,243	$1,554	$945	0.5
Wolfe Dorm Storage 1st Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	500	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	500	0.2	123	0	$18	$292	$80	11.8
Wolfe Dorm Trash Chute 1st Fl	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Wolfe Female Communal 1st Fl	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	4,500	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	4,500	0.0	79	0	$12	$33	$6	2.3
Wolfe Female Communal 1st Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,500	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,105	0.1	831	0	$122	$416	$75	2.8
Wolfe Horseshoe Hallway 1st Fl	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Wolfe Horseshoe Hallway 1st Fl	15	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Timeclock	S	62	6,205	3	Relamp	No	15	LED - Linear Tubes: (2) U-Lamp	Timeclock	33	6,205	0.3	2,969	-1	$434	$1,087	$150	2.2
Wolfe Janitorial closet 1st Fl	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	500		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	500	0.0	0	0	$0	$0	$0	0.0
Wolfe Laundry 1st Fl	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.2	878	0	$128	$453	$85	2.9
Wolfe Male Communal 1st Fl	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.2	878	0	$128	$453	$85	2.9
1001T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1001T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1002T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1002T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1004T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1004T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1005T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1005T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1007T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
1007T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1008T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1008T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1009T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1009T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1010T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1010T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1011T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1011T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1012T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1012T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1013T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1013T	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
1014T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1014T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1015T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1015T	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
1016T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1016T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1017T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1017T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1021T	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
1021T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1021T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1022T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
1022T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1023T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1023T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1024T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1024T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1025T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1025T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1026T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1026T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1027T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1027T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1028T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1028T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1029T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1029T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1030T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1030T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1031T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1031T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1033T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1033T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
Travers Dorm Lobby 10th Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	8,760	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,044	0.2	2,851	-1	$417	$562	$115	1.1
Travers Dorm Lounge 10th Fl	1	LED - Fixtures: Ceiling Mount	Wall Switch	S	9	3,800		None	No	1	LED - Fixtures: Ceiling Mount	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Travers Dorm Lounge 10th Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	8,760	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,044	0.2	2,851	-1	$417	$562	$115	1.1
Travers Dorm Trash Chute 10th	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Travers Female Communal 10th Fl	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
Travers Female Communal 10th Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.1	702	0	$103	$416	$75	3.3
Travers Horseshoe Hallway 10th Fl	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Travers Horseshoe Hallway 10th Fl	15	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Timeclock	S	62	6,205	3	Relamp	No	15	LED - Linear Tubes: (2) U-Lamp	Timeclock	33	6,205	0.3	2,969	-1	$434	$1,087	$150	2.2
Travers Janitorial closet 10th	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	500		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	500	0.0	0	0	$0	$0	$0	0.0
Travers Male Communal 10th Fl	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.2	878	0	$128	$453	$85	2.9
1001	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1001	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1002	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1002	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1004	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1004	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1005	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1005	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1007	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1007	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1008	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1008	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1009	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1009	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1010	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1010	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1011	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1011	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1012	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
1012	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1013	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1013	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
1014	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1014	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1015	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1015	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
1016	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1016	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1017	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1017	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1021	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
1021	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1021	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1022	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1022	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1023	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1023	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1024	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1024	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1025	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1025	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1026	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1026	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1027	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
1027	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1028	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1028	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1029	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1029	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1030	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1030	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1031	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1031	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
1033	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
1033	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
Wolfe Dorm Lobby 10th Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	8,760	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,044	0.2	2,851	-1	$417	$562	$115	1.1
Wolfe Dorm Lounge 10th Fl	1	LED - Fixtures: Ceiling Mount	Wall Switch	S	9	3,800		None	No	1	LED - Fixtures: Ceiling Mount	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Wolfe Dorm Lounge 10th Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.2	1,237	0	$181	$562	$115	2.5
Wolfe Dorm Trash Chute 10th	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Wolfe Female Communal 10th Fl	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
Wolfe Female Communal 10th Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.1	702	0	$103	$416	$75	3.3
Wolfe Horseshoe Hallway 10th Fl	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Wolfe Horseshoe Hallway 10th Fl	15	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Timeclock	S	62	6,205	3	Relamp	No	15	LED - Linear Tubes: (2) U-Lamp	Timeclock	33	6,205	0.3	2,969	-1	$434	$1,087	$150	2.2
Wolfe Janitorial closet 10th	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	500		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	500	0.0	0	0	$0	$0	$0	0.0
Wolfe Male Communal 10th Fl	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.2	878	0	$128	$453	$85	2.9
101T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
101T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
102T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
102T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
103T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
103T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
104T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
104T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
105T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
105T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
106T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
106T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
107T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
107T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
108T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
108T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
109T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
109T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
110T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
110T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
112T	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.2	1,237	0	$181	$562	$115	2.5
121T	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
121T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
121T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
122T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
122T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
123T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
123T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
124T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
124T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
125T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
125T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
126T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
126T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
127T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
127T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
128T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
128T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
129T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
129T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
130T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
130T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
131T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
131T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
133T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
133T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
Elevator Machine Room Travers	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	500	3	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	500	0.2	163	0	$24	$329	$90	10.0
Travers Dorm Stairs 1	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,800	3, 5	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,622	0.6	3,686	-1	$539	$1,892	$945	1.8
Travers Dorm Stairs 2	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch		62	3,800	3, 5	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,622	0.6	3,686	-1	$539	$1,892	$945	1.8
Travers Dorm Storage 1st Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3	Relamp	No	4	LED - Linear Tubes: (4) 4' Lamps	Wall Switch	58	3,800	0.2	936	0	$137	$292	$80	1.5
Travers Dorm Trash Chute 1st Fl	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Travers Female Communal 1st Fl	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
Travers Female Communal 1st Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.1	702	0	$103	$416	$75	3.3
Travers Horseshoe Hallway 1st Fl	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Travers Horseshoe Hallway 1st Fl	15	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Timeclock	S	62	6,205	3	Relamp	No	15	LED - Linear Tubes: (2) U-Lamp	Timeclock	33	6,205	0.3	2,969	-1	$434	$1,087	$150	2.2
Travers Janitorial closet 1st Fl	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	500		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	500	0.0	0	0	$0	$0	$0	0.0
Travers Laundry 1st Fl	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.2	878	0	$128	$453	$85	2.9
Travers Male Communal 1st Fl	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.2	878	0	$128	$453	$85	2.9
201	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
201	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
202	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
202	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
203	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
203	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
204	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
204	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
205	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
205	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
206	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
206	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
207	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
207	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
208	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
208	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
209	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
209	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
210	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
210	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
211	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
211	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
212	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
212	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
213	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
213	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
214	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
214	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
215	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
215	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
216	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
216	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
217	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
217	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
221	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
221	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
221	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
222	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
222	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
223	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
223	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
224	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
224	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
225	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
225	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
226	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
226	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
227	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
227	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
228	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
228	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
229	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
229	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
230	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
230	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
231	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
231	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
233	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
233	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
Wolfe Dorm Lobby 2nd Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	8,760	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	6,044	0.2	2,851	-1	$417	$562	$115	1.1
Wolfe Dorm Lounge 2nd Fl	1	LED - Fixtures: Ceiling Mount	Wall Switch	S	9	3,800		None	No	1	LED - Fixtures: Ceiling Mount	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Wolfe Dorm Lounge 2nd Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.2	1,237	0	$181	$562	$115	2.5
Wolfe Dorm Trash Chute 2nd	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
Wolfe Female Communal 2nd Fl	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
Wolfe Female Communal 2nd Fl	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.1	702	0	$103	$416	$75	3.3
Wolfe Horseshoe Hallway 2nd Fl	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Wolfe Horseshoe Hallway 2nd Fl	15	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Timeclock	S	62	6,205	3	Relamp	No	15	LED - Linear Tubes: (2) U-Lamp	Timeclock	33	6,205	0.3	2,969	-1	$434	$1,087	$150	2.2
Wolfe Janitorial closet 2nd	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	500		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	500	0.0	0	0	$0	$0	$0	0.0
Wolfe Male Communal 2nd Fl	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,800	3, 4	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,622	0.2	878	0	$128	$453	$85	2.9
201T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
201T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
202T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
202T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
203T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
203T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
204T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
204T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
205T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
205T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
206T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
206T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
207T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
207T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
208T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
208T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
209T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
209T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
210T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
210T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
211T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
211T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
212T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
212T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
213T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
213T	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
214T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
214T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
215T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
215T	2	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,622	0.1	618	0	$90	$416	$40	4.2
216T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
216T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
217T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
217T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
221T	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	S	9	3,800		None	No	1	LED Lamps: (1) 9W A21 Screw-In Lamp	Wall Switch	9	3,800	0.0	0	0	$0	$0	$0	0.0
221T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
221T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
222T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
222T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
223T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
223T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
224T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
224T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
225T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
225T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
226T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
226T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
227T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
227T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
228T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7
228T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0
229T	1	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	S	33	3,800	3	Relamp	No	1	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,800	0.0	67	0	$10	$33	$6	2.7

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
229T	2	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	S	32	3,800	3, 4	Relamp	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,622	0.0	184	0	$27	$307	$10	11.0

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Fire Pump Room Travers	Steam System	2	Condensate Pump	3.0	80.0%	No	Baldor		W	2,745		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room Wolfe	Steam System	2	Condensate Pump	3.0	80.0%	No	Baldor		W	2,745		No	80.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Pizza Oven	1	Exhaust Fan	0.5	78.2%	No	Acme	PNU160RG	W	5,000		No	78.2%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-11	1	Exhaust Fan	0.3	69.5%	No	Greenheck	GB-141-4	W	5,000		No	69.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	EF-5	1	Exhaust Fan	2.0	86.5%	No	Greenheck	Cube 300	W	5,000	6	No	86.5%	Yes	1	0.6	3,234	0	$476	$3,261	$100	6.6
Roof	EF-7	1	Exhaust Fan	0.3	73.4%	No	Greenheck	GB-161-4	W	5,000		No	73.4%	No		0.0	0	0	$0	$0	$0	0.0
Roof	GEF-008	1	Exhaust Fan	0.5	74.0%	No	Baldor		W	5,000		No	74.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Kitchen Hood Exhaust	1	Exhaust Fan	1.5	86.5%	No	Acme	PNU200RG	W	5,000	8	No	86.5%	Yes	1	0.4	2,426	0	$357	$3,391	$75	9.3
Roof	TEF-002	1	Exhaust Fan	1.0	85.5%	No	Trane		W	5,000		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof Travers	EF-1	1	Exhaust Fan	1.5	86.5%	No	Greenheck	Cube 300	W	5,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof Travers	EF-2	1	Exhaust Fan	1.0	85.5%	No	Greenheck	Cube 300	W	5,000		No	85.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof Travers	EF-3	1	Exhaust Fan	1.5	86.5%	No	Greenheck	Cube 300	W	5,000	6	No	86.5%	Yes	1	0.4	2,426	0	$357	$3,391	$75	9.3
Roof Wolfe	EF-10	1	Exhaust Fan	2.0	86.5%	No	Greenheck	Cube 300	W	5,000	6	No	86.5%	Yes	1	0.6	3,234	0	$476	$3,261	$100	6.6
Roof Wolfe	EF-8	1	Exhaust Fan	5.0	89.5%	No	Greenheck	Cube 300	W	5,000	6	No	89.5%	Yes	1	1.5	7,814	0	$1,150	$4,076	$900	2.8
Roof Wolfe	EF-9	1	Exhaust Fan	2.0	86.5%	No	Greenheck	Cube 300	W	5,000	6	No	86.5%	Yes	1	0.6	3,234	0	$476	$3,261	$100	6.6
Fire Pump Room Travers	HWP1, HWP2	2	Heating Hot Water Pump	15.0	90.2%	No			W	4,500	7	No	93.0%	Yes	2	3.3	44,139	0	$6,494	$126,582	$2,400	19.1
Mechanical Room Wolfe	HWP3, HWP4	2	Heating Hot Water Pump	7.5	88.5%	No			W	4,500	7	No	91.0%	Yes	2	1.6	22,392	0	$3,294	$65,726	$2,000	19.3
Elevator Machine Room	Elevator Motors	3	Other	20.0	92.4%	No	Reuland		W	810		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Elevator Machine Room Travers	Elevator Motors	3	Other	20.0	92.4%	No	Reuland		W	810		No	92.4%	No		0.0	0	0	$0	$0	$0	0.0
Fire Pump Room Travers	Sump Pump	2	Process Pump	1.0	82.5%	No			W	2,745		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Mechanical Room Wolfe	Sump Pump	2	Process Pump	1.0	82.5%	No			W	2,745		No	82.5%	No		0.0	0	0	$0	$0	$0	0.0
Fire Pump Room Travers	DHW loop	1	DHW Circulation Pump	5.0	82.5%	No	Marathon		W	8,760	9	No	89.5%	Yes	1	0.7	9,831	0	$1,446	$41,576	$900	28.1
Fire Pump Room Travers	DHW loop	1	DHW Circulation Pump	5.0	80.0%	No	U.S Electrical		W	8,760	9	No	89.5%	Yes	1	0.7	10,666	0	$1,569	$41,576	$900	25.9
Fire Pump Room Travers	DHW loop	1	DHW Circulation Pump	1.5	84.0%	No	Baldor		W	8,760		No	84.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Room Wolfe	DHW loop	1	DHW Circulation Pump	5.0	82.0%	No	Baldor		W	8,760	9	No	89.5%	Yes	1	0.7	9,994	0	$1,470	$41,576	$900	27.7
Mechanical Room Wolfe	DHW loop	1	DHW Circulation Pump	5.0	85.5%	No	Marathon		W	8,760	9	No	89.5%	Yes	1	0.6	8,893	0	$1,308	$41,576	$900	31.1
Kitchen Storage	Kitchen HV	1	Supply Fan	5.0	89.5%	No			W	6,500	6	No	89.5%	Yes	1	1.4	10,159	0	$1,494	$4,076	$900	2.1
Roof	AHU1	1	Supply Fan	15.0	89.5%	No	Baldor		W	6,500	6	No	93.0%	Yes	1	4.5	32,540	0	$4,787	$7,041	$1,200	1.2
Roof	AHU2	1	Supply Fan	15.0	89.5%	No	Baldor		W	6,500	6	No	93.0%	Yes	1	4.5	32,540	0	$4,787	$7,041	$1,200	1.2
Roof	AHU3	1	Supply Fan	10.0	89.5%	No	Baldor		W	6,500	6	No	91.7%	Yes	1	3.0	21,194	0	$3,118	$5,152	$1,100	1.3
Mechanical /Storage Rooms	Unit Heaters	6	Supply Fan	0.2	65.0%	No	Nesbitt		W	2,745		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0

Packaged HVAC Inventory & Recommendations

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/EER)	Heating Mode Efficiency	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Roof	ACU 001	1	Split-System	41.22		9.22		Trane	SA403C	B	10	Yes	1	Split-System	41.22		12.50		7.0	30,637	0	$4,507	$43,377	$3,504	8.8
Roof	ACU 002	1	Split-System	41.22		9.22		Trane	SA403C	B	10	Yes	1	Split-System	41.22		12.50		7.0	30,637	0	$4,507	$43,377	$3,504	8.8
Roof	ACU 003	1	Split-System	102.47		9.12		Trane	RAUA8006	B	10	Yes	1	Split-System	102.47		12.00		16.2	70,277	0	$10,339	$84,029	$7,890	7.4
Roof	IT Room	1	Ductless Mini-Split HP	3.00	40.00	14.90	2.8 COP	Daikin	RXYMQ36MVJU	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	IT Room	1	Ductless Mini-Split HP	3.00	40.00	14.90	2.8 COP	Daikin	RXYMQ36MVJU	W		No							0.0	0	0	$0	$0	$0	0.0
112T	112T	1	Electric Resistance Heat		2.56		1 COP		3UG3D	W		No							0.0	0	0	$0	$0	$0	0.0
615	615	1	Electric Resistance Heat		5.12		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
613T	613T	1	Electric Resistance Heat		2.56		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
615T	615T	1	Electric Resistance Heat		2.56		1 COP			W		No							0.0	0	0	$0	$0	$0	0.0
Roof	148/150	2	Ductless Mini-Split AC	0.75	10.90	13.00	3.71 COP	Mistubishi	MUZ-A09NA	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	155	1	Ductless Mini-Split AC	0.75	12.20	16.00	7.7 HSPF	Sanyo	CH0971	W		No							0.0	0	0	$0	$0	$0	0.0
Roof	158	1	Ductless Mini-Split AC	0.75	12.20	16.00	7.7 HSPF	Sanyo	CH0971	W		No							0.0	0	0	$0	$0	$0	0.0
Roof Travers	Elevator Machine Room Wolfe	2	Ductless Mini-Split AC	3.00	36.00	16.00	8.5 HSPF	Carrier	38MAQB36R--3	W		No							0.0	0	0	$0	$0	$0	0.0
Roof Wolfe	Elevator Machine Room Travers	2	Ductless Mini-Split AC	3.00	36.00	16.00	8.5 HSPF	Carrier	38MAQB36R--3	W		No							0.0	0	0	$0	$0	$0	0.0
Kitchen Office	Kitchen Office	1	Packaged Terminal HP	0.75	8.20	12.10	3.51 COP	Freidrich	PVH09K3FB	W		No							0.0	0	0	$0	$0	$0	0.0
613	613	1	Window AC	0.50		9.70		GE	AGV06LAG1	W		No							0.0	0	0	$0	$0	$0	0.0
611T	611T	1	Window AC	0.50		9.70				W		No							0.0	0	0	$0	$0	$0	0.0
613T	613T	1	Window AC	0.50		11.20		GE	AEL06LVL1	W		No							0.0	0	0	$0	$0	$0	0.0
613T	613T	1	Window AC	0.50		9.70		GE	AGV06LAG1	W		No							0.0	0	0	$0	$0	$0	0.0
Repair Shop	Repair Shop	1	Window AC	0.73		11.20		Friedrich		W		No							0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/EER)	Heating Mode Efficiency	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Apartments 13,14,15	Apartments 13,14,15	3	Window AC	1.50		11.00				W		No							0.0	0	0	$0	$0	$0	0.0

Space Heating Boiler Inventory & Recommendations

		Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Central Plant	Building Space Heating	1	Forced Draft Steam Boiler	14,802	Central Plant	Proxy Boiler	W		No						0.0	0	0	$0	$0	$0	0.0

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Central	Building Domestic Hot Water System	1	Indirect System			W		No						0.0	0	0	$0	$0	$0	0.0
Fire pump Room	Apt 114	1	Storage Tank Water Heater (≤ 50 Gal)	Bradford White	M240 L6DS	W		No						0.0	0	0	$0	$0	$0	0.0
Mechanical Room	Rm 23	1	Storage Tank Water Heater (≤ 50 Gal)	AO Smith	EES 40 913	W		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Building	11	699	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	332	$1,403	$5,012	$2,796	1.6

Walk-In Cooler/Freezer Inventory & Recommendations

	Existing Conditions				Proposed Conditions				Energy Impact & Financial Analysis						
Location	Cooler/ Freezer Quantity	Case Type/Temperature	Manufacturer	Model	ECM #	Install EC Evaporator Fan Motors?	Install Electric Defrost Control?	Install Evaporator Fan Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen 2	1	Medium Temp Freezer (0F to 30F)	Bally	BLP214 MAS	12	Yes	No	No	0.1	524	0	$77	$607	$80	6.8
Outside	1	Cooler (35F to 55F)	Trenton Refrigeration		12	Yes	No	No	0.1	524	0	$77	$607	$80	6.8
Kitchen Storage 2	1	Medium Temp Freezer (0F to 30F)	Bally	BEHA015E6	12	Yes	No	No	0.1	655	0	$96	$303	$40	2.7
Outside	1	Low Temp Freezer (-35F to -5F)	Trenton Refrigeration	TESA036L6	12	Yes	No	No	0.2	1,311	0	$193	$303	$40	1.4
Kitchen 2	1	Low Temp Freezer (-35F to -5F)	Bally	BLP419LE-S2B	12	Yes	No	No	0.1	1,049	0	$154	$1,213	$160	6.8
Kitchen Storage 2	1	Low Temp Freezer (-35F to -5F)	Bally	BLP419LE-S2B	12	Yes	No	No	0.1	786	0	$116	$910	$120	6.8
Outside	1	Low Temp Freezer (-35F to -5F)	Bally	BEZA055L6	12	Yes	No	No	0.2	1,311	0	$193	$303	$40	1.4

Commercial Refrigerator/Freezer Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Refrigerator/ Freezer Type	Manufacturer	Model	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Dining Area	1	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	Continental	UC36	Yes		No	0.0	0	0	$0	$0	$0	0.0
Dining Area	2	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	Continental	CPA43	Yes		No	0.0	0	0	$0	$0	$0	0.0
Dining Area	2	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Continental	DL72	Yes		No	0.0	0	0	$0	$0	$0	0.0
Dining Area	1	Stand-Up Refrigerator, Solid Door (≤15 cu. ft.)	Minus Forty		Yes		No	0.0	0	0	$0	$0	$0	0.0
Dining Area	1	Freezer Chest			No	13	Yes	0.4	3,902	0	$574	$2,150	$0	3.7
Dining Area	1	Stand-Up Freezer, Solid Door (31 - 50 cu. ft.)	Continental	DL2F1	Yes		No	0.0	0	0	$0	$0	$0	0.0
Dining Area	3	Stand-Up Refrigerator, Solid Door (16 - 30 cu. ft.)	Continental		Yes		No	0.0	0	0	$0	$0	$0	0.0

Commercial Ice Maker Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Ice Maker Type	Manufacturer	Model	ENERGY STAR Qualified?	ECM #	Install ENERGY STAR Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen Storage	1	Self-Contained Unit (≥175 lbs/day), Batch	Manitowac		Yes		No	0.0	0	0	$0	$0	$0	0.0

Novelty Cooler Inventory & Recommendations

	Existing Conditions				Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Cooler Description	Manufacturer	Model	ECM #	Install Automatic Shutoff Control?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Dining Hall	1	Cooler Description				No	0.00	0	0	$0	$0	$0	0.0

Cooking Equipment Inventory & Recommendations

	Existing Conditions					Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Equipment Type	Manufacturer	Model	High Efficiency Equipement?	ECM #	Install High Efficiency Equipment?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Kitchen	1	Insulated Food Holding Cabinet (Full Size)	Traulsen		Yes		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Half Size)	Southbend		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Full Size)	Southbend		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Convection Oven (Full Size)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Griddle (3 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Griddle (3 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Griddle (4 Feet Width)			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	4	Gas Large Vat Fryer			No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Steamer	Cleveland	24CGA10.2ES	Yes		No	0.0	0	0	$0	$0	$0	0.0

Plug Load Inventory

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
Travers Wolfe Hall	14	Desktop	100	No		
Laundry Rooms	20	Clothes Dryer	3,000	No		
Laundry Rooms	28	Clothes Washer	1,500	No		
Travers Wolfe Hall	16	Fan	60	No		
Travers Wolfe Hall	17	Microwave	1,200	No		
Travers Wolfe Hall	1	Electric Stove	3,500	No		
Travers Wolfe Hall	4	Soda Machine	2,500	No		
Travers Wolfe Hall	1	Paper Shredder	750	No		
Travers Wolfe Hall	2	Printer (Medium/Small)	150	No		
Travers Wolfe Hall	1	Copier	400	No		
Travers Wolfe Hall	2	Projector	75	No		
Travers Wolfe Hall	2	Refrigerator (Mini)	300	No		
Travers Wolfe Hall	4	Residential Refrigerator	1,250	No		
Travers Wolfe Hall	6	Speakers	450	No		
Travers Wolfe Hall	22	Television	125	No		
Travers Wolfe Hall	2	Coffee Machine	1,250	No		
Dining Hall Cooking Equipment	1	Dough Maker	1,500	No		
Dining Hall Cooking Equipment	1	Electric oven	2,000	No		
Dining Hall Cooking Equipment	2	Heat cup	5,000	No		
Dining Hall Cooking Equipment	7	Buffet Table	2,000	No		
Dining Hall Cooking Equipment	1	Ice cream machine	4,400	No		
Dining Hall Cooking Equipment	1	Pizza maker	3,500	No		
Dining Hall Cooking Equipment	1	Storge	1,000	No		
Dining Hall Cooking Equipment	3	Warming units	220	No		
Dining Hall Cooking Equipment	1	Flour mixer	249	No		
Dining Hall Cooking Equipment	1	Flour Mixer	746	No		
Dorm Rooms	1	Misc. Plug Loads	84,000	No		

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Middle Hall	2	Glass Fronted Refrigerated	14	Yes	0.3	2,418	0	$356	$460	$100	1.0
Middle Hall	1	Non-Refrigerated	14	Yes	0.0	343	0	$50	$230	$0	4.6
Middle Hall	1	Refrigerated	14	Yes	0.2	1,612	0	$237	$230	$50	0.8

Miscellaneous Fuel Inventory

	Existing Conditions					
Location	Quantity	Equipment Description	Input Capacity per Unit (MBh)	ENERGY STAR Qualified?	Manufacturer	Model
Kitchen	1	Gas Kettle	100.0	Yes	Southbend	0.0

Custom (High Level) Measure Analysis

Installation of an Energy Management System

Building Square Footage: 20,000
Percent of Conditioned Area Impacted: 100%
Fuel Utility Rate: $4.231 MMBtu
Blended Electric Utility Rate: $0.147 kWh

Existing Conditions						Proposed Conditions					Energy Impact & Financial Analysis						
Description	Area(s)/System(s) Served	Remaining Useful Life	Total HVAC Motor Usage kWh	Total HVAC Electric Usage kWh	Total HVAC Fuel Usage MMBtu	Description	% Savings HVAC Motor Usage kWh	% Savings HVAC Electric Usage kWh	% Savings HVAC Fuel Usage MMBtu	Estimated Cost per Sqft	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Limited/No HVAC Controls	HVAC Equipment & Systems	15	590,679	643,392	35,668	Installation of an Energy Management System	2%	2%	2%	$2.00	0.00	24,681	713	$6,649	$40,000	$0	6.02

Sub Metering

Existing Conditions					Proposed Conditions					Energy Impact & Financial Analysis						
Description	Existing Main Meter Annual kWh	Electric (kWh)	Steam (MMBtu)	Chilled Water (MMBtu)	Description	% Electric Savings	% Gas Savings	Number of Meters	Estimated Unit Cost	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Payback w/ Incentives in Years
Campus Wide Metering	No Current Metering	2,834,022	37,053	-	Electric Smart Sub Meter, Steam Flow and Chilled Water Meters	1%	1%	2	Varies	0.00	28,340	371	$5,737	$9,100	$0	1.59

APPENDIX B: ENERGY STAR® STATEMENT OF ENERGY PERFORMANCE

EUI is presented in terms of *site energy* and *source energy*. Site energy is the amount of fuel and electricity consumed by a building as reflected in utility bills. Source energy includes fuel consumed to generate electricity consumed at the site, factoring in electric production and distribution losses for the region.

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ENERGY STAR® Statement of Energy Performance

N/A

ENERGY STAR® Score[1]

The College of New Jersey

Primary Property Type: College/University
Gross Floor Area (ft²): 2,775,363
Built: 1855

For Year Ending: January 31, 2020
Date Generated: November 23, 2020

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

Property Address	Property Owner	Primary Contact
The College of New Jersey 2000 Pennington Road Ewing, New Jersey 08628	The College of New Jersey 2000 Pennington Rd Ewing, NJ 08628 609-771-2874	David Matlack 2000 Pennington Road Ewing, NJ 08628 609-771-2874 matlack@tcnj.edu

Property ID: 5984875

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
233.6 kBtu/ft²

Source EUI
263.4 kBtu/ft²

Annual Energy by Fuel	
Electric - Grid (kBtu)	28,774,949 (4%)
Natural Gas (kBtu)	619,522,872 (96%)

National Median Comparison	
National Median Site EUI (kBtu/ft²)	160.2
National Median Source EUI (kBtu/ft²)	180.6
% Diff from National Median Source EUI	46%
Annual Emissions	
Greenhouse Gas Emissions (Metric Tons CO2e/year)	35,660

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

LP Signature: _____ Date: _____

Licensed Professional

___ _____
,
(___)___-_____
_____

Professional Engineer or Registered Architect Stamp (if applicable)

APPENDIX C: GLOSSARY

TERM	DEFINITION
Blended Rate	Used to calculate fiscal savings associated with measures. The blended rate is calculated by dividing the amount of your bill by the total energy use. For example, if your bill is $22,217.22, and you used 266,400 kilowatt-hours, your blended rate is 8.3 cents per kilowatt-hour.
Btu	*British thermal unit*: a unit of energy equal to the amount of heat required to increase the temperature of one pound of water by one-degree Fahrenheit.
CHP	*Combined heat and power*. Also referred to as cogeneration.
COP	*Coefficient of performance*: a measure of efficiency in terms of useful energy delivered divided by total energy input.
Demand Response	Demand response reduces or shifts electricity usage at or among participating buildings/sites during peak energy use periods in response to time-based rates or other forms of financial incentives.
DCV	*Demand control ventilation*: a control strategy to limit the amount of outside air introduced to the conditioned space based on actual occupancy need.
US DOE	*United States Department of Energy*
EC Motor	*Electronically commutated motor*
ECM	*Energy conservation measure*
EER	*Energy efficiency ratio*: a measure of efficiency in terms of cooling energy provided divided by electric input.
EUI	*Energy Use Intensity:* measures energy consumption per square foot and is a standard metric for comparing buildings' energy performance.
Energy Efficiency	Reducing the amount of energy necessary to provide comfort and service to a building/area. Achieved through the installation of new equipment and/or optimizing the operation of energy use systems. Unlike conservation, which involves some reduction of service, energy efficiency provides energy reductions without sacrifice of service.
ENERGY STAR®	ENERGY STAR® is the government-backed symbol for energy efficiency. The ENERGY STAR® program is managed by the EPA.
EPA	*United States Environmental Protection Agency*
Generation	The process of generating electric power from sources of primary energy (e.g., natural gas, the sun, oil).
GHG	*Greenhouse gas* gases that are transparent to solar (short-wave) radiation but opaque to long-wave (infrared) radiation, thus preventing long-wave radiant energy from leaving Earth's atmosphere. The net effect is a trapping of absorbed radiation and a tendency to warm the planet's surface.
gpf	*Gallons per flush*

gpm	*Gallon per minute*
HID	*High intensity discharge:* high-output lighting lamps such as high-pressure sodium, metal halide, and mercury vapor.
hp	*Horsepower*
HPS	*High-pressure sodium*: a type of HID lamp
HSPF	*Heating seasonal performance factor:* a measure of efficiency typically applied to heat pumps. Heating energy provided divided by seasonal energy input.
HVAC	*Heating, ventilating, and air conditioning*
IHP 2014	US DOE Integral Horsepower rule. The current ruling regarding required electric motor efficiency.
IPLV	*Integrated part load value:* a measure of the part load efficiency usually applied to chillers.
kBtu	One thousand British thermal units
kW	*Kilowatt*: equal to 1,000 Watts.
kWh	*Kilowatt-hour*: 1,000 Watts of power expended over one hour.
LED	*Light emitting diode*: a high-efficiency source of light with a long lamp life.
LGEA	*Local Government Energy Audit*
Load	The total power a building or system is using at any given time.
Measure	A single activity, or installation of a single type of equipment, that is implemented in a building system to reduce total energy consumption.
MH	*Metal halide*: a type of HID lamp
MBh	*Thousand Btu per hour*
MBtu	*One thousand British thermal units*
MMBtu	*One million British thermal units*
MV	*Mercury Vapor:* a type of HID lamp
NJBPU	*New Jersey Board of Public Utilities*
NJCEP	*New Jersey's Clean Energy Program:* NJCEP is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment.
psig	Pounds per square inch gauge
Plug Load	Refers to the amount of power used in a space by products that are powered by means of an ordinary AC plug.
PV	*Photovoltaic:* refers to an electronic device capable of converting incident light directly into electricity (direct current).

SEER	*Seasonal energy efficiency ratio:* a measure of efficiency in terms of annual cooling energy provided divided by total electric input.
SEP	*Statement of energy performance:* a summary document from the ENERGY STAR® Portfolio Manager®.
Simple Payback	The amount of time needed to recoup the funds expended in an investment or to reach the break-even point between investment and savings.
SREC	*Solar renewable energy credit*: a credit you can earn from the state for energy produced from a photovoltaic array.
TREC	*Transition Incentive Renewable Energy Certificate:* a factorized renewable energy certificate you can earn from the state for energy produced from a photovoltaic array.
T5, T8, T12	A reference to a linear lamp diameter. The number represents increments of 1/8th of an inch.
Temperature Setpoint	The temperature at which a temperature regulating device (thermostat, for example) has been set.
therm	100,000 Btu. Typically used as a measure of natural gas consumption.
tons	A unit of cooling capacity equal to 12,000 Btu/hr.
Turnkey	Provision of a complete product or service that is ready for immediate use
VAV	*Variable air volume*
VFD	*Variable frequency drive*: a controller used to vary the speed of an electric motor.
WaterSense®	The symbol for water efficiency. The WaterSense® program is managed by the EPA.
Watt (W)	Unit of power commonly used to measure electricity use.