Local Government Energy Audit Report

West New York Public School No. 4 (Albio Sires Elementary)

April 1, 2022

Prepared for:

West New York Board of Education
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West New York, New Jersey 07093

Prepared by:

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Disclaimer

The goal of this audit report is to identify potential energy efficiency opportunities and help prioritize specific measures for implementation. 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.

Incentive values provided in this report are estimated based of previously run state efficiency programs. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available utility 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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ENERGY EFFICIENCY INCENTIVE & REBATE TRANSITION

For the purposes of your LGEA, estimated incentives and rebates are included as placeholders for planning purposes. New Jersey utilities are rolling out their own energy efficiency programs, which your project may be eligible for depending on individual measures, quantities, and size of the building.

In 2018, Governor Murphy signed into law the landmark legislation known as the Clean Energy Act. The law called for a significant overhaul of New Jersey's clean energy systems by building sustainable infrastructure in order to fight climate change and reduce carbon emissions, which will in turn create well-paying local jobs, grow the state's economy, and improve public health while ensuring a cleaner environment for current and future residents.

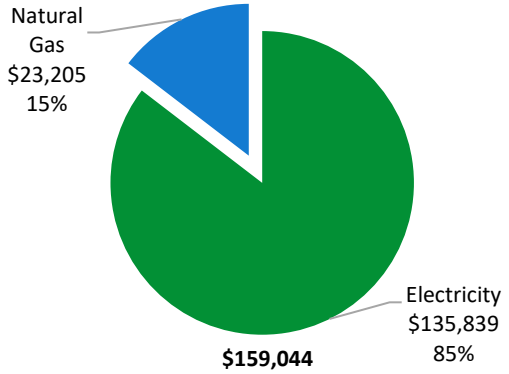
These "next generation" energy efficiency programs feature new ways of managing and delivering programs historically administered by New Jersey's Clean Energy Program™ (NJCEP). All of the investor-owned gas and electric utility companies will now also offer complementary energy efficiency programs and incentives directly to customers like you. NJCEP will still offer programs for new construction, renewable energy, the Energy Savings Improvement Program (ESIP), and large energy users.

New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website.

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for West New York Public School No. 4 (Albio Sires Elementary). 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: $159,044 Electricity: 1,045,644 kWh Natural Gas: 26,392 Therms	
ENERGY STAR® Benchmarking Score	72 *(1-100 scale)*	Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

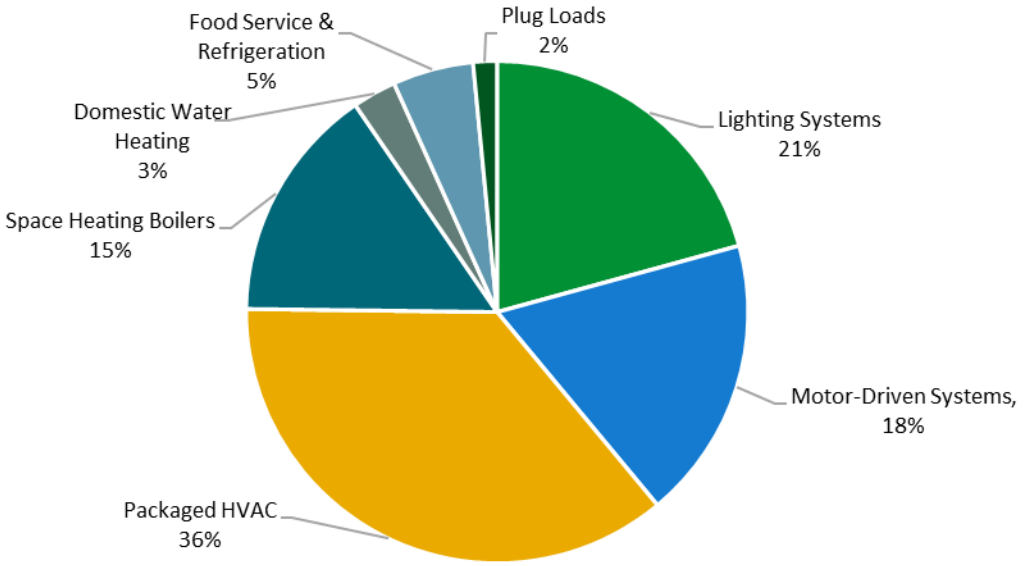


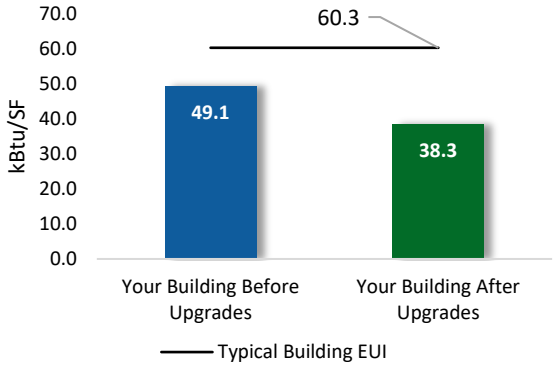
Figure 1 - Energy Use by System

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.

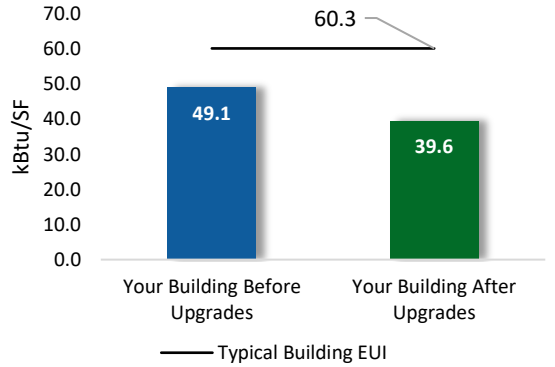
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$379,628
Potential Rebates & Incentives[1]	$68,607
Annual Cost Savings	$50,980
Annual Energy Savings	Electricity: 389,689 kWh Natural Gas: 405 Therms
Greenhouse Gas Emission Savings	199 Tons
Simple Payback	6.1 Years
Site Energy Savings (All Utilities)	22%



Scenario 2: Cost Effective Package[2]

Installation Cost	$208,698
Potential Rebates & Incentives	$54,332
Annual Cost Savings	$44,738
Annual Energy Savings	Electricity: 341,639 kWh Natural Gas: 405 Therms
Greenhouse Gas Emission Savings	174 Tons
Simple Payback	3.5 Years
Site Energy Savings (all utilities)	19%



On-site Generation Potential

Photovoltaic	High
Combined Heat and Power	None

[1] Incentives are based on previously run state rebate programs. Contact your utility provider for current program incentives that 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			**201,084**	**44.8**	**-37**	**$25,801**	**$83,864**	**$19,604**	**$64,260**	**2.5**	**198,208**
ECM 1	Install LED Fixtures	Yes	24,634	0.3	0	$3,198	$17,327	$2,850	$14,477	4.5	24,782
ECM 2	Retrofit Fixtures with LED Lamps	Yes	176,450	44.5	-36	$22,603	$66,537	$16,754	$49,783	2.2	173,426
Lighting Control Measures			**40,876**	**8.8**	**-9**	**$5,235**	**$50,543**	**$23,475**	**$27,068**	**5.2**	**40,161**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	29,850	6.6	-6	$3,823	$34,793	$9,790	$25,003	6.5	29,328
ECM 4	Install High/Low Lighting Controls	Yes	11,026	2.2	-2	$1,412	$15,750	$13,685	$2,065	1.5	10,833
Variable Frequency Drive (VFD) Measures			**85,160**	**29.4**	**0**	**$11,063**	**$62,504**	**$10,875**	**$51,629**	**4.7**	**85,756**
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	76,580	28.5	0	$9,949	$54,352	$9,075	$45,277	4.6	77,116
ECM 6	Install VFDs on Heating Water Pumps	Yes	8,580	1.0	0	$1,115	$8,152	$1,800	$6,352	5.7	8,640
Unitary HVAC Measures			**48,051**	**25.0**	**0**	**$6,242**	**$170,930**	**$14,275**	**$156,655**	**25.1**	**48,386**
ECM 7	Install High Efficiency Air Conditioning Units	No	48,051	25.0	0	$6,242	$170,930	$14,275	$156,655	25.1	48,386
HVAC System Improvements			**10,611**	**0.0**	**80**	**$2,079**	**$8,222**	**$16**	**$8,206**	**3.9**	**20,017**
ECM 8	Implement Demand Control Ventilation (DCV)	Yes	10,611	0.0	69	$1,985	$8,157	$0	$8,157	4.1	18,762
ECM 9	Install Pipe Insulation	Yes	0	0.0	11	$94	$66	$16	$50	0.5	1,255
Domestic Water Heating Upgrade			**1,251**	**0.0**	**6**	**$214**	**$158**	**$77**	**$80**	**0.4**	**1,949**
ECM 10	Install Low-Flow DHW Devices	Yes	1,251	0.0	6	$214	$158	$77	$80	0.4	1,949
Food Service & Refrigeration Measures			**2,657**	**0.1**	**0**	**$345**	**$3,406**	**$285**	**$3,121**	**9.0**	**2,676**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	917	0.1	0	$119	$1,213	$160	$1,053	8.8	924
ECM 12	Refrigeration Controls	Yes	1,740	0.0	0	$226	$2,193	$125	$2,068	9.1	1,752
TOTALS (COST EFFECTIVE MEASURES)			**341,639**	**83.2**	**40**	**$44,738**	**$208,698**	**$54,332**	**$154,365**	**3.5**	**348,767**
TOTALS (ALL MEASURES)			**389,689**	**108.2**	**40**	**$50,980**	**$379,628**	**$68,607**	**$311,020**	**6.1**	**397,153**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

** - 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

Utility run energy efficiency programs and 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.

For details on these programs please visit New Jersey's Clean Energy Program website or contact your utility provider.

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 and Power (CHP)

The CHP program provides incentives for combined heat and power (i.e., 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 West New York Public School No. 4 (Albio Sires Elementary). 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.

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 August 31, 2021, TRC performed an energy audit at West New York Public School No. 4 (Albio Sires Elementary) located in West New York, New Jersey. TRC met with Rick Solares and Tony Perez to review the facility operations and help focus our investigation on specific energy-using systems.

West New York Public School No. 4 (Albio Sires Elementary) is a four-story, 126,413 square foot building built in 1906. Spaces include classrooms and offices, as well as an auditorium, a gymnasium, a cafeteria, a kitchen, computer labs, a library, lounges, corridors, stairwells, restrooms, storage rooms, and electrical and mechanical spaces.

2.2 Building Occupancy

The facility is occupied from September to July, with the school year ending for students in July and restarting in September. Weekend occupancy varies, and the facility closes at 10:00 PM on weekdays. During a typical day, the facility is occupied by approximately 90 staff and 650 students.

Building Name	Weekday/Weekend	Operating Schedule
West New York Public School No. 4 (Albio Sires Elementary)	Weekday	6:00 AM - 10:00 PM
	Weekend	Varies

Figure 3 - Building Occupancy Schedule

2.3 Building Envelope

West New York Public School No. 4 (Albio Sires Elementary) is a four-floor building. Building walls are concrete block over structural steel with a brick facade. The roof is flat, covered with a grey membrane, and in good condition.

Most of the windows are double glazed with storm windows and have aluminum frames. The glass-to-frame seals are in good condition. The windows are new, and the weather seals are in good condition, showing no evidence of excess wear. Exterior doors have aluminum frames and are in good condition with undamaged door seals. Overall, the building envelope appears in good condition.

Roof

Windows

Exterior doors

Facade

2.4 Lighting Systems

The primary interior lighting system uses 32-Watt fluorescent T8 lamps. Fixture types include 1-lamp, 2-lamp, and 3-lamp, 4-foot long recessed, surface mounted, and pendant fixtures with linear tube lamps. There are also a significant number of 42W compact fluorescent lamps (CFL) in some classrooms, the library, cafeteria, and in corridors. Standard incandescent lamps are found in the theater, where there are also 100W halogen incandescent lamps and 40W LED fixtures. The gymnasium has 100W LED high bay fixtures.

Interior light fixtures are controlled using a mix of wall switches, the building energy management system (EMS), and occupancy sensors. All exit signs are 2W LED units. Most fixtures are in good condition and interior light fixtures are generally sufficient. Exterior fixtures include 100W metal halide (MH) wall packs and 175W pole mounted MH fixtures. There are also 100W halogen incandescent lamps and 42W CFL fixtures. Exterior light fixtures are controlled by a timeclock.

Occupancy sensor

4-foot T8 troffer

42W CFL fixtures

2W LED Exit signs

Exterior wall pack - 100W MH fixture

100W - halogen incandescent

100W high bay LED fixtures - Gymnasium

CFL fixtures - Library

2.5 Air Handling Systems

Unitary Electric Heating, Ventilation, and Air Conditioning (HVAC) Equipment

Computer labs 201 and 202 are cooled with 1.25-ton window air conditioning (AC) units with an EER of 11.3. The units were installed in 2017 and are in good condition. The units are controlled by on board temperature controls.

Window AC

Unitary Heating Equipment

The boiler room and the mechanical elevator rooms are heated by Trane® suspended gas fired furnaces. These vary in capacity between 27 and 50 MBh. The units are in fair condition. Equipment is controlled by a manual dial thermostat.

Unit heater

Manual dial thermostat

Packaged Units

Classrooms, corridors, the theater, the gymnasium, and the cafeteria are conditioned by six packaged AC units, RTU 1 - 6. These units are equipped with direct expansion cooling and gas-fired furnace heating. Cooling capacities range from 25 to 75 tons. Heating capacities range from 192 MBh to 840 MBh with an efficiency rating of 80%. RTU 2 – 6 are equipped with constant speed supply and return fans while RTU1 motors are equipped with variable frequency drives (VFD). Variable air volume (VAV) boxes are present for every classroom, and heating for these areas is supplemented by the boiler. A demand control ventilation (DCV) measure has been evaluated for locations served by all six units.

Most of these units were installed in 2005 and have been evaluated for replacement. The units are controlled by an EMS.

RTU 1

RTU 2

RTU 4

RTU-5

2.6 Heating Hot Water Systems

Three RBI gas-fired, non-condensing hot water boilers serve a portion of the building heating load. The boilers have an output capacity of 637.50 MBh and an efficiency rating of 85%. The burners are fully modulating. The boilers are configured in automated lead-lag control scheme. All three boilers are required under high load conditions. Installed in 2007, they are in good condition and well maintained. There is a service contract in place.

The hydronic distribution system is a two-pipe heating only system. The boilers are configured in a constant flow primary distribution with two 5 hp constant speed hot water pumps operating with under an automated control scheme. The boilers provide hot water to hot water baseboards in some of the hallways and to the VAV boxes serving the classrooms.

There is approximately five feet of uninsulated three-inch pipe for which insulation has been evaluated. The existing insulation is in good condition.

Hot water is supplied at 180°F when the outside air temperature is lower than 45°F, and the setpoint is adjusted linearly. The hot water return temperature is typically 77°F.

Non-condensing hot water boilers

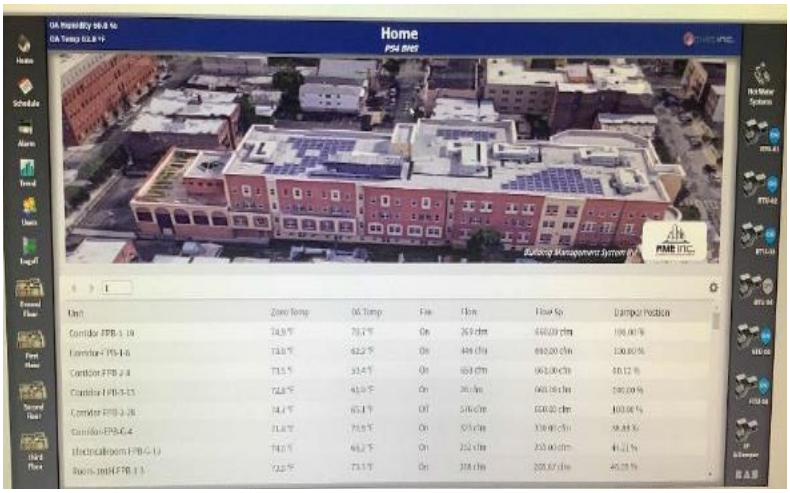
Heating hot water pumps

Recirculation pumps

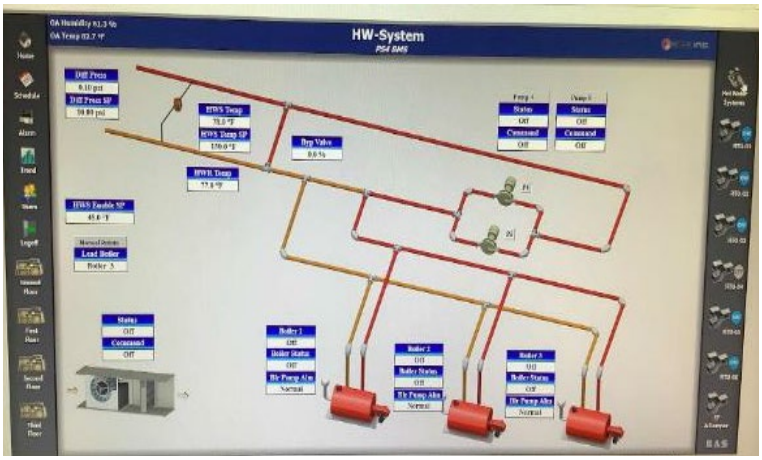
Hot water baseboard (corridor)

2.7 Building EMS

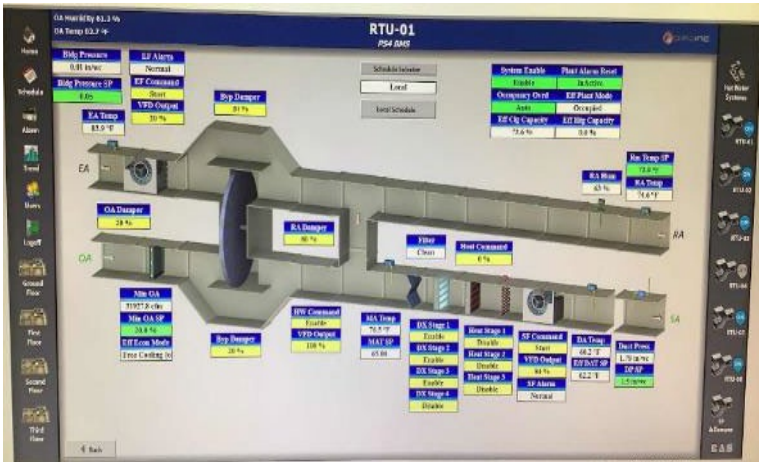
An AME Inc.® EMS controls the HVAC equipment, the boilers, the air handlers, and the package units. The EMS provides equipment scheduling control and monitors and controls space temperatures, supply air temperatures, humidity, and heating water loop temperatures.



EMS screenshot (system status)



EMS screenshot – Boiler System



EMS screenshot – RTU 01

EMS screenshot

2.8 Domestic Hot Water

Hot water is produced by three hot water heaters: two gas-fired and one electric. The gas fired water heaters have an input capacity of 300 MBh and a separate storage tank with a capacity of 300 gallons. These were installed in 2006 and are operating beyond their useful life. The electric water heater has an input capacity of 12 kW and a tank capacity of 38 gallons. This water heater was installed in 2018.

Fractional hp circulating pumps distribute domestic hot water to end uses. The domestic hot water pipes are partially insulated, and the insulation is in good condition. Additional insulation has been evaluated for the system.

Gas-fired DHW

DHW booster pumps

Storage tank

Electric DHW

2.9 Food Service Equipment

The kitchen has a mix of gas and electric equipment that is used to prepare lunches for students. Most cooking is done using a convection oven and conventional gas-fired burner stove. Bulk prepared foods are held in electric holding cabinets. Equipment is standard efficiency.

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

Convection oven

Convection oven

Food holding cabinet

2.10 Refrigeration

The kitchen has a few standard efficiency refrigerator chests. The walk-in refrigerator has an estimated 2-ton compressor located in the kitchen and a two-fan evaporator. The walk-in medium temperature freezer has a 0.7-ton compressor located in the kitchen and a two-fan evaporator equipped with evaporator fan controls.

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

Refrigerator chest

Refrigerator chest

Walk-in cooler

Walk-in medium temperature refrigerator

2.11 Plug Load and 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.

There are approximately 109 computer workstations throughout the facility. Plug loads general cafe and office equipment. There are classroom typical loads such as smart boards, projectors, and fans.

There are several residential style refrigerators throughout the building that are used to store food. These vary in condition and efficiency.

Residential refrigerator

Copier

2.12 Water-Using Systems

The faucet flow rates are at 2.2 gallons per minute (gpm). Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

2.13 On-Site Generation

West New York Public School No. 4 (Albio Sires Elementary) has a rooftop photovoltaic (PV) array with approximately 212 panels. The total array size and install date were not provided by the applicant. This system provides approximately 6% of the electricity used.

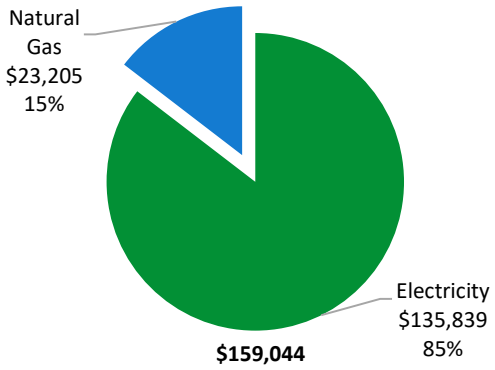
Solar panels

Solar panels

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	1,045,644 kWh	$135,839
Natural Gas	26,392 Therms	$23,205
Total		**$159,044**



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.

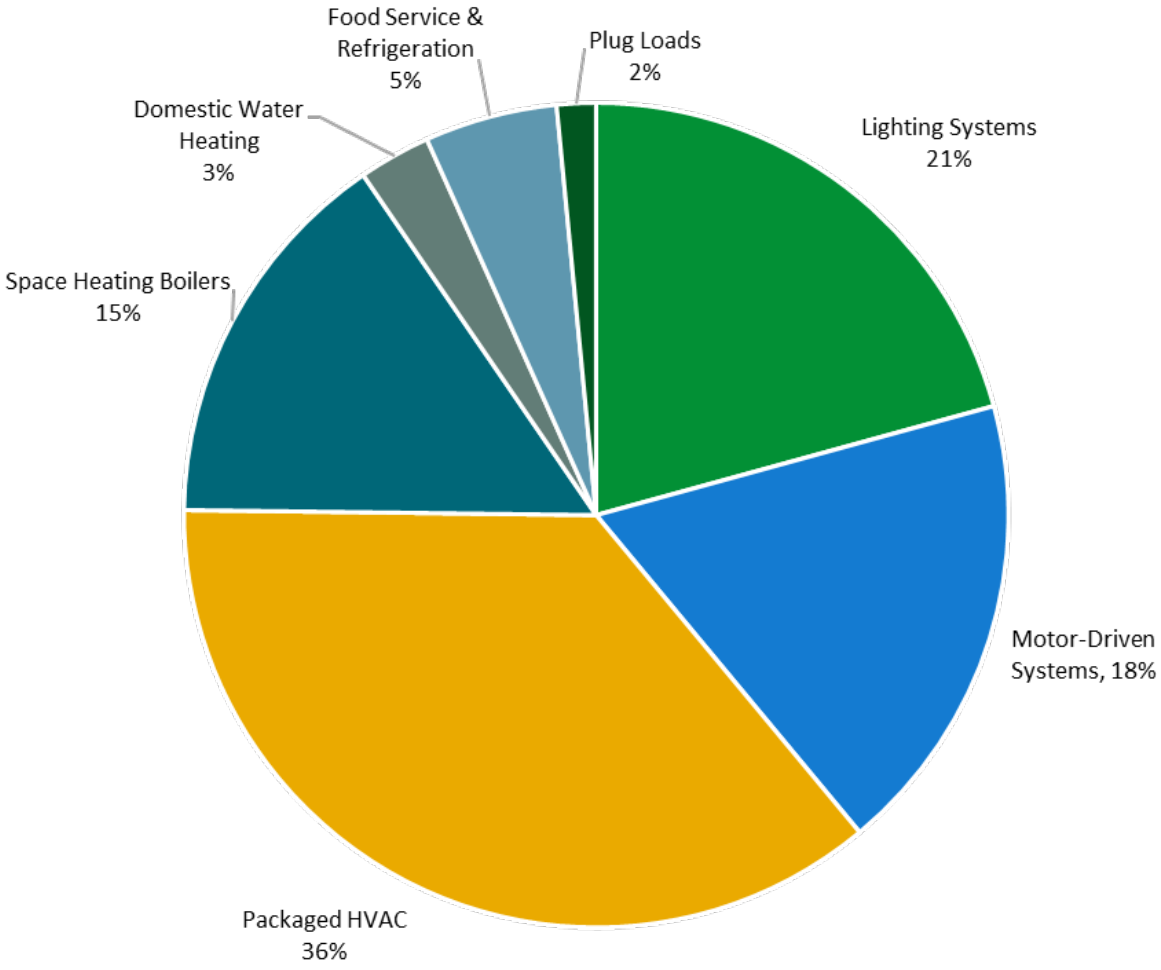
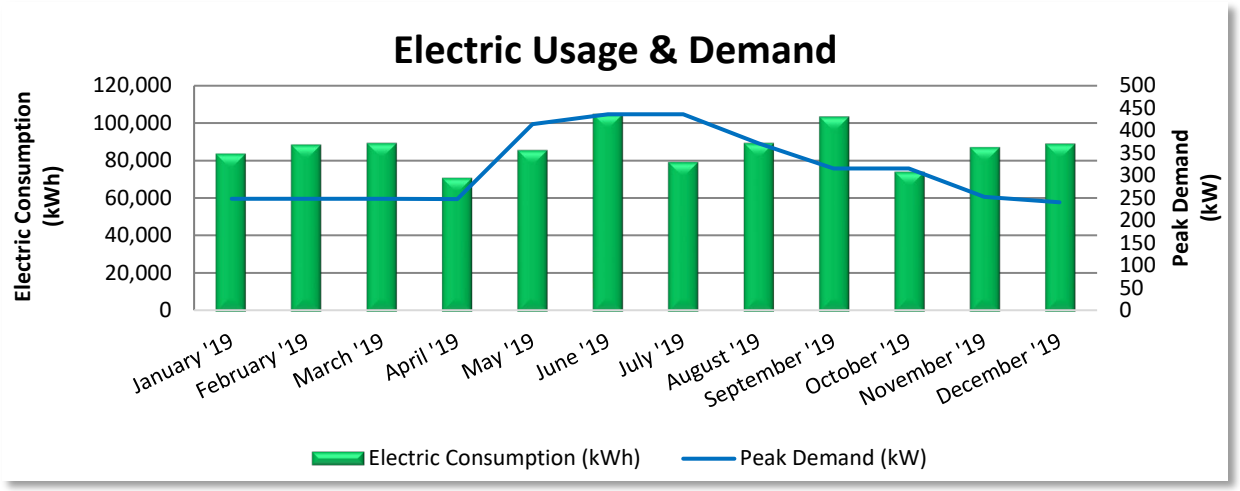


Figure 4 - Energy Balance

3.1 Electricity

PSE&G delivers electricity under rate class LPLS, with electric production provided by G&S Hudson Solar, a third-party supplier.



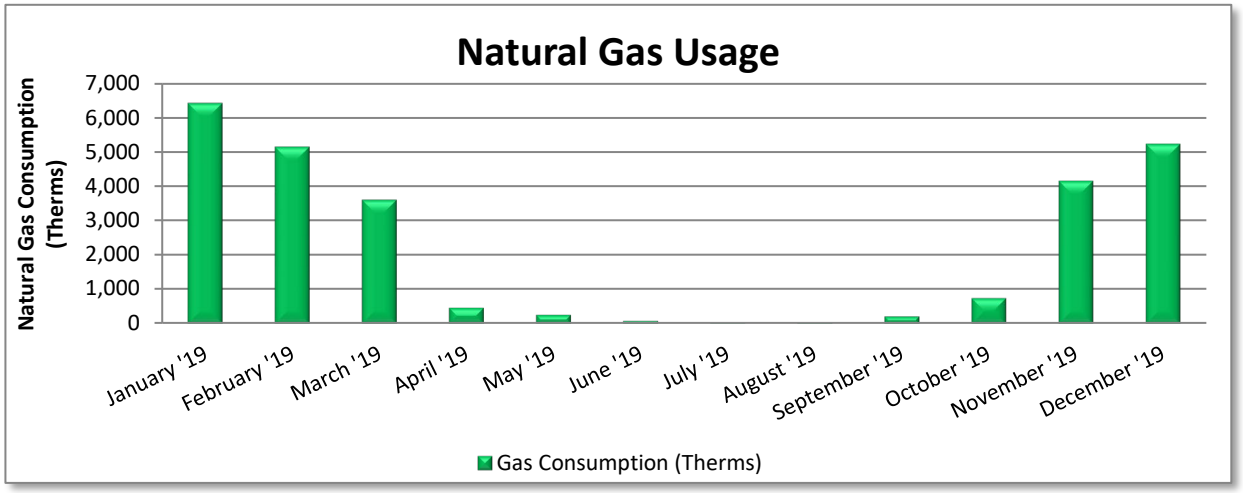
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
2/6/19	28	83,580	248	$926	$9,062
3/8/19	30	88,298	248	$929	$9,515
4/7/19	30	89,106	248	$929	$10,138
5/7/19	30	70,800	248	$928	$8,124
6/6/19	30	85,313	414	$5,246	$13,973
7/9/19	33	104,531	437	$5,530	$16,128
8/7/19	29	79,144	437	$16,860	$14,407
9/6/19	30	89,095	372	$4,713	$13,843
10/8/19	32	103,153	316	$1,187	$11,752
11/5/19	28	73,932	316	$1,187	$8,791
12/6/19	31	86,966	253	$950	$9,810
1/8/20	33	88,861	241	$905	$9,923
Totals	**364**	**1,042,779**	**437**	**$40,292**	**$135,467**
Annual	**365**	**1,045,644**	**437**	**$40,402**	**$135,839**

Notes:

- Peak demand of 437 kW occurred in June '19.
- Average demand over the past 12 months was 315 kW.
- The average electric cost over the past 12 months was $0.130/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.

3.2 Natural Gas

PSE&G delivers natural gas under rate class LVG, with natural gas supply provided by East Coast Power & Gas, a third-party supplier.



Gas Billing Data			
Period Ending	**Days in Period**	**Natural Gas Usage (Therms)**	**Natural Gas Cost**
2/6/19	29	6,419	$5,400
3/8/19	30	5,152	$5,059
4/8/19	31	3,612	$2,102
5/8/19	30	471	$386
6/7/19	30	258	$274
7/9/19	32	80	$180
8/7/19	29	20	$105
9/6/19	30	29	$152
10/7/19	31	211	$395
11/5/19	29	747	$1,397
12/6/19	31	4,157	$3,536
1/8/20	33	5,236	$4,218
Totals	**365**	**26,392**	**$23,205**
Annual	**365**	**26,392**	**$23,205**

Notes:

- The average gas cost for the past 12 months is $0.879/therm, which is the blended rate used throughout the analysis.
- The reduced natural gas consumption during the summer months likely reflects usage for domestic hot water and cooking equipment only.

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	72

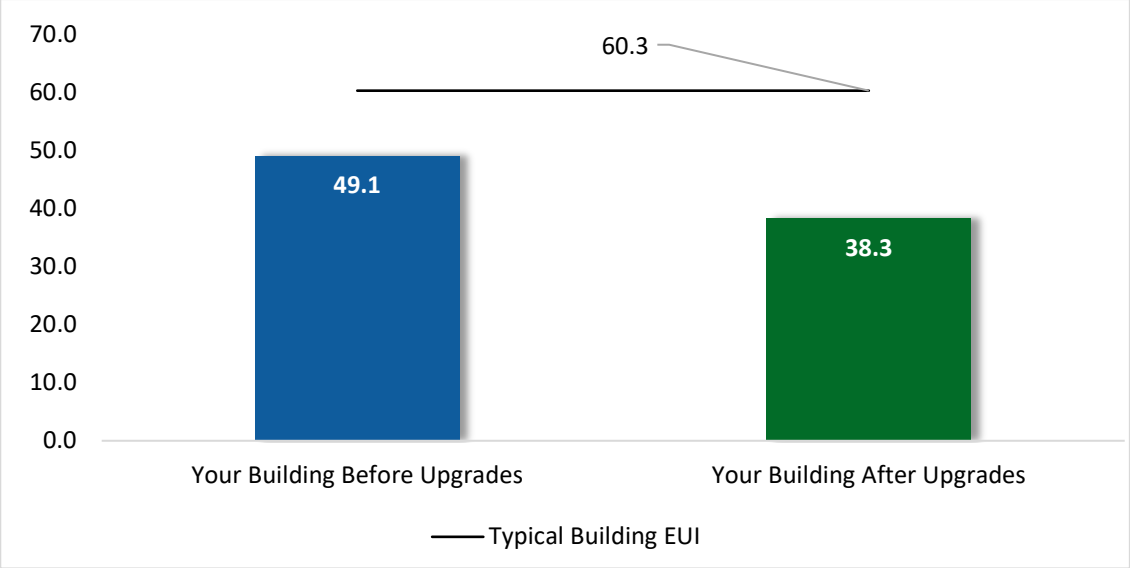


Figure 5 - Energy Use Intensity Comparison[3]

Congratulations, your building performs better than the national average. This report has suggestions about how to keep your building running efficiently, further improve performance, and lower your energy bills even more.

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. Several factors can cause a building to vary from 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 Energy Conservation Measures

The goal of this audit report is to identify and evaluate potential energy efficiency improvements and provide information about the cost effectiveness of those improvements. Most energy conservation measures have received preliminary analysis of feasibility, which identifies expected ranges of savings. 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 previously run state rebate programs. New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website. Some measures and proposed upgrades may be eligible for higher incentives than those shown below.

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			**201,084**	**44.8**	**-37**	**$25,801**	**$83,864**	**$19,604**	**$64,260**	**2.5**	**198,208**
ECM 1	Install LED Fixtures	Yes	24,634	0.3	0	$3,198	$17,327	$2,850	$14,477	4.5	24,782
ECM 2	Retrofit Fixtures with LED Lamps	Yes	176,450	44.5	-36	$22,603	$66,537	$16,754	$49,783	2.2	173,426
Lighting Control Measures			**40,876**	**8.8**	**-9**	**$5,235**	**$50,543**	**$23,475**	**$27,068**	**5.2**	**40,161**
ECM 3	Install Occupancy Sensor Lighting Controls	Yes	29,850	6.6	-6	$3,823	$34,793	$9,790	$25,003	6.5	29,328
ECM 4	Install High/Low Lighting Controls	Yes	11,026	2.2	-2	$1,412	$15,750	$13,685	$2,065	1.5	10,833
Variable Frequency Drive (VFD) Measures			**85,160**	**29.4**	**0**	**$11,063**	**$62,504**	**$10,875**	**$51,629**	**4.7**	**85,756**
ECM 5	Install VFDs on Constant Volume (CV) Fans	Yes	76,580	28.5	0	$9,949	$54,352	$9,075	$45,277	4.6	77,116
ECM 6	Install VFDs on Heating Water Pumps	Yes	8,580	1.0	0	$1,115	$8,152	$1,800	$6,352	5.7	8,640
Unitary HVAC Measures			**48,051**	**25.0**	**0**	**$6,242**	**$170,930**	**$14,275**	**$156,655**	**25.1**	**48,386**
ECM 7	Install High Efficiency Air Conditioning Units	No	48,051	25.0	0	$6,242	$170,930	$14,275	$156,655	25.1	48,386
HVAC System Improvements			**10,611**	**0.0**	**80**	**$2,079**	**$8,222**	**$16**	**$8,206**	**3.9**	**20,017**
ECM 8	Implement Demand Control Ventilation (DCV)	Yes	10,611	0.0	69	$1,985	$8,157	$0	$8,157	4.1	18,762
ECM 9	Install Pipe Insulation	Yes	0	0.0	11	$94	$66	$16	$50	0.5	1,255
Domestic Water Heating Upgrade			**1,251**	**0.0**	**6**	**$214**	**$158**	**$77**	**$80**	**0.4**	**1,949**
ECM 10	Install Low-Flow DHW Devices	Yes	1,251	0.0	6	$214	$158	$77	$80	0.4	1,949
Food Service & Refrigeration Measures			**2,657**	**0.1**	**0**	**$345**	**$3,406**	**$285**	**$3,121**	**9.0**	**2,676**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	Yes	917	0.1	0	$119	$1,213	$160	$1,053	8.8	924
ECM 12	Refrigeration Controls	Yes	1,740	0.0	0	$226	$2,193	$125	$2,068	9.1	1,752
TOTALS			**389,689**	**108.2**	**40**	**$50,980**	**$379,628**	**$68,607**	**$311,020**	**6.1**	**397,153**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 6 – 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		**201,084**	**44.8**	**-37**	**$25,801**	**$83,864**	**$19,604**	**$64,260**	**2.5**	**198,208**
ECM 1	Install LED Fixtures	24,634	0.3	0	$3,198	$17,327	$2,850	$14,477	4.5	24,782
ECM 2	Retrofit Fixtures with LED Lamps	176,450	44.5	-36	$22,603	$66,537	$16,754	$49,783	2.2	173,426
Lighting Control Measures		**40,876**	**8.8**	**-9**	**$5,235**	**$50,543**	**$23,475**	**$27,068**	**5.2**	**40,161**
ECM 3	Install Occupancy Sensor Lighting Controls	29,850	6.6	-6	$3,823	$34,793	$9,790	$25,003	6.5	29,328
ECM 4	Install High/Low Lighting Controls	11,026	2.2	-2	$1,412	$15,750	$13,685	$2,065	1.5	10,833
Variable Frequency Drive (VFD) Measures		**85,160**	**29.4**	**0**	**$11,063**	**$62,504**	**$10,875**	**$51,629**	**4.7**	**85,756**
ECM 5	Install VFDs on Constant Volume (CV) Fans	76,580	28.5	0	$9,949	$54,352	$9,075	$45,277	4.6	77,116
ECM 6	Install VFDs on Heating Water Pumps	8,580	1.0	0	$1,115	$8,152	$1,800	$6,352	5.7	8,640
HVAC System Improvements		**10,611**	**0.0**	**80**	**$2,079**	**$8,222**	**$16**	**$8,206**	**3.9**	**20,017**
ECM 8	Implement Demand Control Ventilation (DCV)	10,611	0.0	69	$1,985	$8,157	$0	$8,157	4.1	18,762
ECM 9	Install Pipe Insulation	0	0.0	11	$94	$66	$16	$50	0.5	1,255
Domestic Water Heating Upgrade		**1,251**	**0.0**	**6**	**$214**	**$158**	**$77**	**$80**	**0.4**	**1,949**
ECM 10	Install Low-Flow DHW Devices	1,251	0.0	6	$214	$158	$77	$80	0.4	1,949
Food Service & Refrigeration Measures		**2,657**	**0.1**	**0**	**$345**	**$3,406**	**$285**	**$3,121**	**9.0**	**2,676**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	917	0.1	0	$119	$1,213	$160	$1,053	8.8	924
ECM 12	Refrigeration Controls	1,740	0.0	0	$226	$2,193	$125	$2,068	9.1	1,752
TOTALS		**341,639**	**83.2**	**40**	**$44,738**	**$208,698**	**$54,332**	**$154,365**	**3.5**	**348,767**

* - All incentives presented in this table are included as placeholders for planning purposes and are based on previously run state rebate programs. Contact your utility provider for details on current programs.

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

Figure 7 – Cost Effective 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		**201,084**	**44.8**	**-37**	**$25,801**	**$83,864**	**$19,604**	**$64,260**	**2.5**	**198,208**
ECM 1	Install LED Fixtures	24,634	0.3	0	$3,198	$17,327	$2,850	$14,477	4.5	24,782
ECM 2	Retrofit Fixtures with LED Lamps	176,450	44.5	-36	$22,603	$66,537	$16,754	$49,783	2.2	173,426

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 is 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 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 fixture(s).

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: gymnasium, theater, and exterior fixtures.

ECM 2: Retrofit Fixtures with LED Lamps

Replace fluorescent, HID, CFL or 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. Be sure to specify replacement lamps that are compatible with existing dimming controls, where applicable. In some circumstances, you may need to upgrade your dimming system for optimum performance.

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, HID, CFL, and incandescent lamp fixtures.

#	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		**40,876**	**8.8**	**-9**	**$5,235**	**$50,543**	**$23,475**	**$27,068**	**5.2**	**40,161**
ECM 3	Install Occupancy Sensor Lighting Controls	29,850	6.6	-6	$3,823	$34,793	$9,790	$25,003	6.5	29,328
ECM 4	Install High/Low Lighting Controls	11,026	2.2	-2	$1,412	$15,750	$13,685	$2,065	1.5	10,833

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 3: Install Occupancy Sensor Lighting Controls

Install 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.

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.

Affected Building Areas: offices, conference rooms, classrooms, gymnasium, library, restrooms, and storage rooms.

ECM 4: 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.

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 occupants approach the area.

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

Affected Building Areas: hallways and stairwells.

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		**85,160**	**29.4**	**0**	**$11,063**	**$62,504**	**$10,875**	**$51,629**	**4.7**	**85,756**
ECM 5	Install VFDs on Constant Volume (CV) Fans	76,580	28.5	0	$9,949	$54,352	$9,075	$45,277	4.6	77,116
ECM 6	Install VFDs on Heating Water Pumps	8,580	1.0	0	$1,115	$8,152	$1,800	$6,352	5.7	8,640

VFDs 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 5: Install VFDs on Constant Volume (CV) Fans

Install VFDs to control CV fan motor speeds. This converts a constant-volume, single-zone air handling system into a 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 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: RTU 2, 3, 4, 5, and 6.

ECM 6: Install VFDs on Heating Water Pumps

Install VFDs 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: Two 5 hp HHW 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		**48,051**	**25.0**	**0**	**$6,242**	**$170,930**	**$14,275**	**$156,655**	**25.1**	**48,386**
ECM 7	Install High Efficiency Air Conditioning Units	48,051	25.0	0	$6,242	$170,930	$14,275	$156,655	25.1	48,386

Replacing the unitary HVAC units has a long payback period and may not be justifiable based simply on energy considerations. However, most of the units are nearing or have reached the end of their normal useful life. Typically, the marginal cost of purchasing a high efficiency unit can be justified by the marginal savings from the improved efficiency. When the packaged units are eventually replaced, consider purchasing equipment that exceeds the minimum efficiency required by building codes.

ECM 7: Install High Efficiency AC Units

We evaluated replacing standard efficiency packaged AC units with high efficiency packaged AC units. All of the replacement units will incorporate efficient gas furnaces. 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: RTU 2, 3, 4, 5, and 6.

4.5 HVAC Improvements

#	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)
HVAC System Improvements		**10,611**	**0.0**	**80**	**$2,079**	**$8,222**	**$16**	**$8,206**	**3.9**	**20,017**
ECM 8	Implement Demand Control Ventilation (DCV)	10,611	0.0	69	$1,985	$8,157	$0	$8,157	4.1	18,762
ECM 9	Install Pipe Insulation	0	0.0	11	$94	$66	$16	$50	0.5	1,255

ECM 8: Implement DCV

DCV monitors the indoor air's carbon dioxide (CO_2) content to measure room occupancy. This data is used to regulate the amount of outdoor air provided to the space for ventilation.

Standard ventilation systems often provide outside air based on a space's estimated maximum occupancy but not actual occupancy. During low occupancy periods, the space may then be over ventilated. This wastes energy through heating and cooling the excess outside air flow. DCV reduces unnecessary outdoor air intake by regulating ventilation based on actual occupancy levels. DCV is most suited for facilities where occupancy levels vary significantly from hour to hour and day to day.

Energy savings associated with DCV are based on hours of operation, space occupancy, outside air reduction, and other factors. Energy savings results from eliminating unnecessary ventilation and space conditioning.

Affected Building Areas: classrooms, library, gymnasium, cafeteria, and theater.

ECM 9: Install Pipe Insulation

Install insulation on heating water and domestic hot water system piping. Distribution system losses are dependent on system fluid temperature, the size of the distribution system, and the level of insulation of the piping. Significant energy savings can be achieved when insulation has not been well maintained. When the insulation is exposed to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated system efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Affected Systems: hot water piping and domestic hot water piping.

4.6 Domestic Water Heating (DHW)

#	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		**1,251**	**0.0**	**6**	**$214**	**$158**	**$77**	**$80**	**0.4**	**1,949**
ECM 10	Install Low-Flow DHW Devices	1,251	0.0	6	$214	$158	$77	$80	0.4	1,949

ECM 10: 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.

4.7 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		**2,657**	**0.1**	**0**	**$345**	**$3,406**	**$285**	**$3,121**	**9.0**	**2,676**
ECM 11	Refrigerator/Freezer Case Electrically Commutated Motors	917	0.1	0	$119	$1,213	$160	$1,053	8.8	924
ECM 12	Refrigeration Controls	1,740	0.0	0	$226	$2,193	$125	$2,068	9.1	1,752

ECM 11: Refrigerator/Freezer Case Electrically Commutated Motors

Replace shaded pole or permanent split capacitor 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 12: Refrigeration Controls

Install additional controls to optimize the operation of walk-in freezer.

Defrost controllers can be used to override defrost of evaporator fans when the defrost operation is not necessary, which reduces annual energy consumption. This measure is applicable to existing evaporator fans with a traditional electric de-frost mechanism.

Energy savings for each of the control measures account for reduction in compressor and fan operating hours as well as reduction in the refrigeration heat load as appropriate.

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 5% –20% 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, and planned capital upgrades, and it 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 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 cannot manage what you do not 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[4] . Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

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 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.

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

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 AC 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 you should check for fire dampers or balancing dampers that have failed closed.

Duct leakage in commercial buildings can account for 5%–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.

Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to keeping the heating system running efficiently and preventing expensive repairs. Annual tune-ups should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely and efficiently. Boilers should be cleaned according to the manufacturer's instructions to remove soot and scale from the boiler tubes to improve heat transfer.

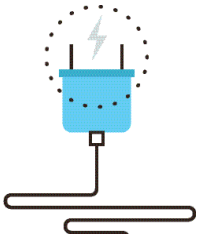
Water Heater Maintenance

The lower the supply water temperature that is used for hand washing sinks, the less energy is needed to heat the water. Reducing the temperature results in energy savings and the change is often unnoticeable to users. Be sure to review the domestic water temperature requirements for sterilizers and dishwashers as you investigate reducing the supply water temperature.

Also, preventative maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. At least once a year, follow manufacturer instructions to drain a few gallons out of the water heater using the drain valve. If there is a lot of sediment or debris, then a full flush is recommended. Turn the temperature down and then completely drain the tank. Annual checks should include checks for:

- Leaks or heavy corrosion on the pipes and valves.
- Corrosion or wear on the gas line and on the piping. If you noticed any black residue, soot, or charred metal, this is a sign you may be having combustion issues and you should have the unit serviced by a professional.
- For electric water heaters, look for signs of leaking such as rust streaks or residue around the upper and lower panels covering the electrical components on the tank.
- For water heaters more than three years old, have a technician inspect the sacrificial anode annually.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[5]. Your local utility may offer incentives or rebates for this equipment.

[5] For additional information refer to "Assessing and Reducing Plug and Process Loads in Office Buildings" http://www.nrel.gov/docs/fy13osti/54175.pdf, or "Plug Load Best Practices Guide" http://www.advancedbuildings.net/plug-load-best-practices-guide-offices.

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 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.

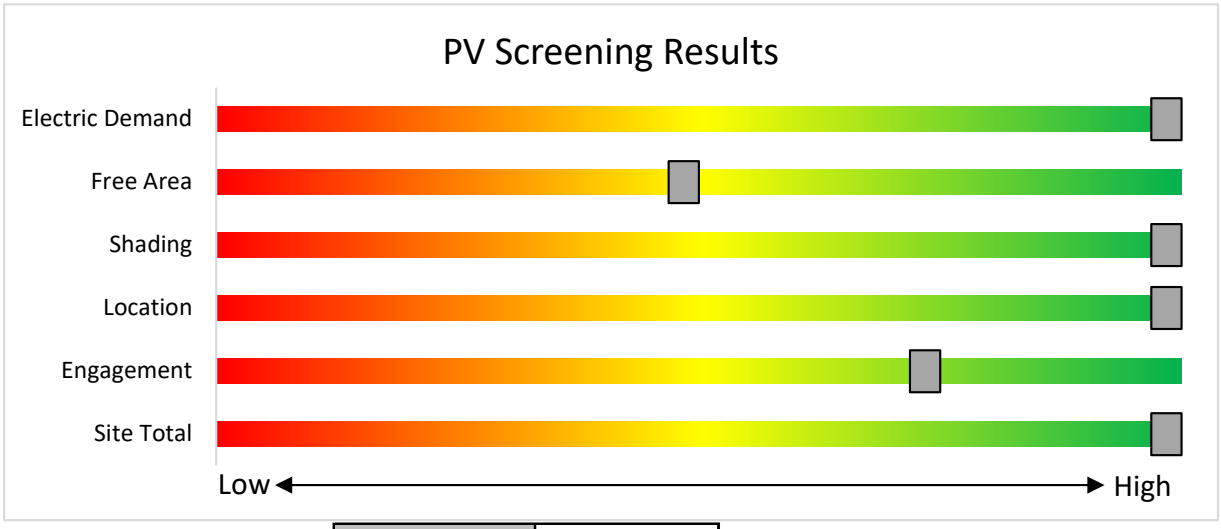
6.1 Solar Photovoltaic

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 high potential for installing additional PV arrays.

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the high expansion 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	High	
System Potential	54	kW DC STC
Electric Generation	64,334	kWh/yr
Displaced Cost	$8,360	/yr
Installed Cost	$140,400	

Figure 8 - Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available for solar projects. Solar projects may qualify to earn SREC- IIs (Solar Renewable Energy Certificates-II), however, the project owners *must* register their solar projects prior to the start of construction to establish the project's eligibility.

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:

Successor Solar Incentive Program (SuSI): https://www.njcleanenergy.com/renewable-energy/programs/susi-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. 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.

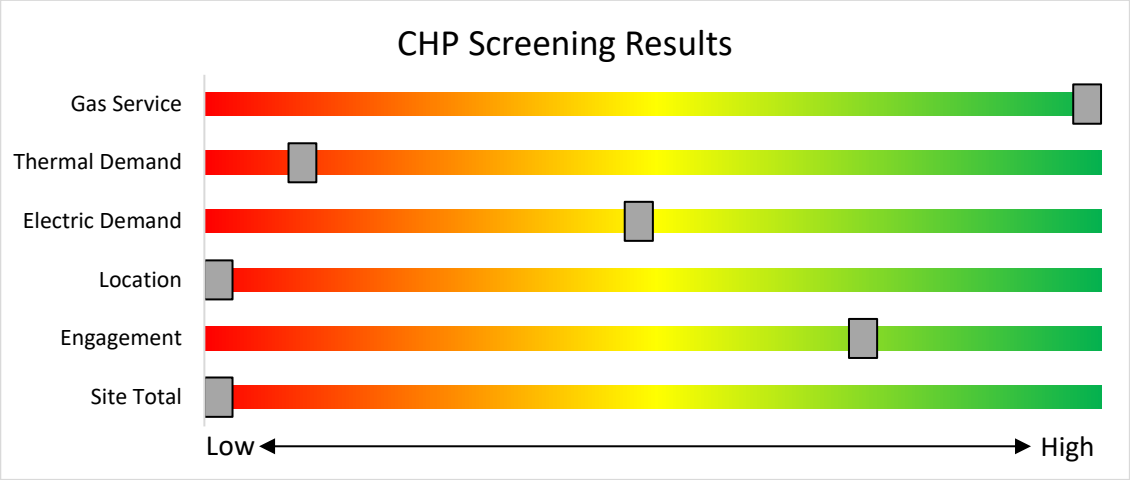


Figure 9 - Combined Heat and Power Screening

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? Your utility provider may be able to help.

7.1 Utility Energy Efficiency Programs

New utility programs are expected to start rolling out in the spring and summer of 2021. Keep up to date with developments by visiting the NJCEP website.

8 New Jersey's Clean Energy Programs

New Jersey's Clean Energy Program will continue to offer some energy efficiency programs.

8.1 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 will 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.

8.2 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 energy conservation measures (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 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.

8.3 Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The program is used to register and certify 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 SREC-IIs (Solar Renewable Energy Certificates-II). SuSI consists of two sub-programs. The Administratively Determined Incentive (ADI) Program and the Competitive Solar Incentive (CSI) Program.

Administratively Determined Incentive (ADI) Program

The ADI Program provides administratively set incentives for net metered residential projects, net metered non-residential projects 5 MW or less, and all community solar projects.

After the registration is accepted, construction is complete, and a complete final as-built packet has been submitted, the project is issued a New Jersey certification number, which enables it to generate New Jersey SREC- IIs.

Market Segments	Size MW dc	Incentive Value ($/SREC II)	Public Entities Incentive Value - $20 Adder ($/SRECII)
Net Metered Residential	All types and sizes	$90	N/A
Small Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects smaller than 1 MW	$100	$120
Large Net Metered Non-Residential located on Rooftop, Carport, Canopy and Floating Solar	Projects 1 MW to 5 MW	$90	$110
Small Net Metered Non-Residential Ground Mount	Projects smaller than 1 MW	$85	$105
Large Net Metered Non-Residential Ground Mount	Projects 1 MW to 5 MW	$80	$100
LMI Community Solar	Up to 5 MW	$90	N/A
Non-LMI Community Solar	Up to 5 MW	$70	N/A
Interim Subsection (t)	All types and sizes	$100	N/A

Eligible projects may generate SREC-IIs for 15 years following the commencement of commercial operations which is defined as permission to operate (PTO) from the Electric Distribution Company. After 15 years, projects may be eligible for a NJ Class I REC.

SREC-IIs will be purchased monthly by the SREC-II Program Administrator who will allocate the SREC-IIs 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.

The ADI Program online portal is now open to new registrations effective August 28, 2021.

Competitive Solar Incentive Program

The Competitive Solar Incentive (CSI) Program will provide competitively set incentives for grid supply projects and net metered non-residential projects greater than 5MW. The program is currently under development with the goal of holding the first solicitation by early-to-mid 2022. For updates, please continue to check the Solar Proceedings page on the New Jersey's Clean Energy Program website.

Solar projects help the State of New Jersey reach renewable energy goals outlined in the state's Energy Master Plan.

If you are considering installing solar photovoltaics on your building, visit the following link for more information: https://njcleanenergy.com/renewable-energy/programs/susi-program.

Energy conservation measures (ECMs) have been identified for your site, and their energy and economic analyses are provided within this LGEA report. Note that some of the identified projects may be mutually exclusive, such as replacing equipment versus upgrading motors or controls. 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 that includes the review of multiple bids for project work, incorporates potential operations and maintenance (O&M) cost savings, and maximizes your incentive potential.

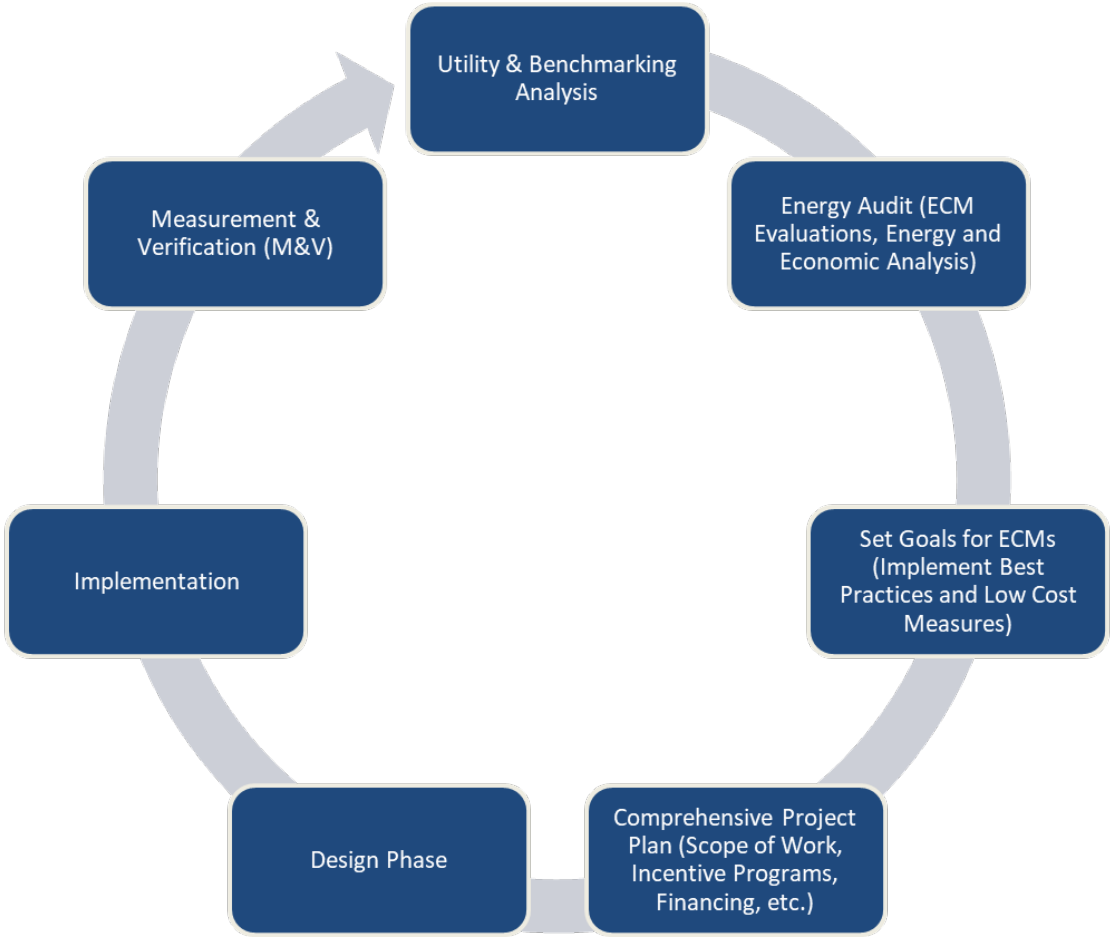


Figure 10 – Project Development Cycle

10.1 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. 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].

10.2 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 fluctuate monthly. The utility provides basic gas supply service 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
Cafeteria	31	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Wall Switch	S	42	3,315	2, 3	Relamp	Yes	31	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,287	0.5	2,408	-1	$308	$1,229	$136	3.5
Cafeteria	8	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	None	S	42	2,550	2, 3	Relamp	Yes	8	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	1,760	0.1	478	0	$61	$378	$43	5.5
Cafeteria	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
Cafeteria	77	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,315	2, 3	Relamp	Yes	77	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,287	2.3	11,790	-2	$1,510	$4,432	$980	2.3
Classroom 106	4	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	4	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	111	0	$14	$54	$4	3.5
Classroom 106	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 106	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 106	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 107	4	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	4	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	111	0	$14	$54	$4	3.5
Classroom 107	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 107	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 107	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 108	4	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	4	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	111	0	$14	$54	$4	3.5
Classroom 108	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 108	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 109	4	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	4	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	111	0	$14	$54	$4	3.5
Classroom 109	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 109	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 109	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 110	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 110	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,380	0	$177	$657	$180	2.7
Classroom 110	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 110a	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 110a	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.5	1,724	0	$221	$822	$225	2.7
Classroom 110a	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0

	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
Classroom 111	4	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	4	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	111	0	$14	$54	$4	3.5
Classroom 111	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 111	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 111	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 112	4	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	4	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	111	0	$14	$54	$4	3.5
Classroom 112	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 112	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 112	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 113	4	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	4	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	111	0	$14	$54	$4	3.5
Classroom 113	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 113	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 113	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Conference 101H	1	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	1	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	28	0	$4	$14	$1	3.5
Conference 101H	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	460	0	$59	$219	$60	2.7
Corridor 1st Floor	84	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Other	S	42	3,315	2, 4	Relamp	Yes	84	LED Lamps: PL-L (Biax) Lamps	High/Low Control	30	2,287	1.3	6,524	-1	$836	$4,284	$3,024	1.5
Corridor 1st Floor	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 1st Floor	37	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Other	S	32	3,315	2, 4	Relamp	Yes	37	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,287	0.6	2,968	-1	$380	$2,251	$1,480	2.0
Corridor 1st Floor	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	3,315	2, 4	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,287	0.5	2,297	0	$294	$1,223	$675	1.9
Corridor Kitchen/Stage	3	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Other	S	42	3,315	2, 4	Relamp	Yes	3	LED Lamps: PL-L (Biax) Lamps	High/Low Control	30	2,287	0.0	233	0	$30	$266	$108	5.3
Corridor Kitchen/Stage	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor Kitchen/Stage	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Other	S	93	3,315	2, 4	Relamp	Yes	7	LED - Linear Tubes: (3) 4' Lamps	High/Low Control	44	2,287	0.3	1,608	0	$206	$833	$350	2.3
Corridor Theater	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor Theater	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,315	2, 4	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,287	0.1	612	0	$78	$371	$180	2.4
CST Office #1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	424	0	$54	$226	$50	3.2
CST Office #2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	424	0	$54	$226	$50	3.2

	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
CST Office #3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	424	0	$54	$226	$50	3.2
Electrical Room 1st Floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.1	165	0	$21	$189	$40	7.1
Electrical Room 1st Floor #2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.0	65	0	$8	$37	$10	3.2
Elevator	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,550	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	2,550	0.0	93	0	$12	$37	$10	2.2
Janitorial Closet 1st Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.0	65	0	$8	$37	$10	3.2
Kitchen	6	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Wall Switch	S	42	3,060	2, 3	Relamp	Yes	6	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.1	430	0	$55	$351	$41	5.6
Kitchen	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
Kitchen	12	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	3,060	2, 3	Relamp	Yes	12	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,111	0.6	2,988	-1	$383	$1,146	$275	2.3
Lounge MO	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,060	0.0	167	0	$21	$55	$15	1.9
Main Entrance	2	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Other	S	42	2,300	2, 3	Relamp	Yes	2	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	1,587	0.0	108	0	$14	$297	$37	18.8
Main Entrance	1	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	None	S	42	2,550	2	Relamp	No	1	LED Lamps: PL-L (Biax) Lamps	None	30	2,550	0.0	34	0	$4	$14	$1	2.9
Main Office	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 Office	19	Linear Fluorescent - T8: 4' T8 (32W) - 1L	None	S	32	2,550	2, 3	Relamp	Yes	19	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	1,760	0.3	1,172	0	$150	$887	$165	4.8
Main Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,696	0	$217	$708	$155	2.5
Main Office 101g	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	424	0	$54	$226	$50	3.2
Nurses Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	690	0	$88	$329	$90	2.7
Office 105	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Office 105	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	1,060	0	$136	$544	$110	3.2
Principals Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	848	0	$109	$489	$95	3.6
Restroom - Female 117	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,550	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	2,550	0.0	93	0	$12	$37	$10	2.2
Restroom - Female 117	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,111	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	307	0	$39	$146	$40	2.7
Restroom - Female MO	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom - Kitchen	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	283	0	$36	$189	$40	4.1
Restroom - Male 116	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,111	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	307	0	$39	$146	$40	2.7
Restroom - Male 116	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,550	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	2,550	0.0	93	0	$12	$37	$10	2.2

	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
Restroom - Male MO	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom - Nurse	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 106	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 107	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 108	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 109	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 110	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 110a	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 112	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 113	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Security Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Server Room 1st Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Stage	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
Stage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.2	848	0	$109	$489	$95	3.6
Stairs A	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs A	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None		62	2,550	2, 4	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,760	0.3	1,296	0	$166	$852	$495	2.1
Stairs B	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs B	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None		62	2,550	2, 4	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,760	0.5	1,767	0	$226	$1,223	$675	2.4
Stairs C	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Stairs C	15	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None		62	2,550	2, 4	Relamp	Yes	15	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	1,760	0.5	1,767	0	$226	$1,223	$675	2.4
Storage Main 101	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Storage Main 101a	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	247	0	$32	$226	$50	5.5
Storage Nurse	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	247	0	$32	$226	$50	5.5
Storage/Office Kitchen	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.1	330	0	$42	$416	$40	8.9
Theater	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

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Theater	20	Halogen Incandescent: 100W - 1L	Wall Switch	S	100	3,060	2, 3	Relamp	Yes	20	LED Lamps: A21 lamsp	Occupancy Sensor	15	2,111	1.3	6,035	-1	$773	$1,244	$90	1.5
Theater	19	Incandescent: (1) 75W A19 Screw-In Lamp	Wall Switch	S	75	3,060	2, 3	Relamp	Yes	19	LED Lamps: A19 Lamps	Occupancy Sensor	12	2,111	0.9	4,267	-1	$546	$867	$89	1.4
Theater	45	LED - Fixtures: Ceiling Mount	Wall Switch	S	40	3,060	3	None	Yes	45	LED - Fixtures: Ceiling Mount	Occupancy Sensor	40	2,111	0.4	1,878	0	$241	$810	$105	2.9
Theater Controls	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.1	165	0	$21	$189	$40	7.1
Classroom 203	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 203	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 204	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 204	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 205	2	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Occupancy Sensor	S	42	2,111	2	Relamp	No	2	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,111	0.0	56	0	$7	$27	$2	3.5
Classroom 205	6	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	6	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	690	0	$88	$329	$90	2.7
Classroom 206	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 206	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$226	$50	3.9
Classroom 207	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$226	$50	3.9
Classroom 207	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 208	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 208	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$226	$50	3.9
Classroom 209	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 209	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$226	$50	3.9
Classroom 210	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$226	$50	3.9
Classroom 210	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 211	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$226	$50	3.9
Classroom 211	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 213	16	Compact Fluorescent: (2) 28W Double Biaxial Plug-In Lamps	Wall Switch	S	56	3,060	2, 3	Relamp	Yes	16	LED Lamps: GX23 (Plug-In) Lamps	Occupancy Sensor	40	2,111	0.3	1,530	0	$196	$940	$102	4.3
Classroom 213	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2, 3	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.4	1,696	0	$217	$708	$155	2.5
Classroom 213	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	1,060	0	$136	$544	$110	3.2

	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
Classroom 221	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.2	883	0	$113	$544	$110	3.8
Classroom 221	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.3	1,035	0	$133	$493	$135	2.7
Classroom 222	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.2	883	0	$113	$544	$110	3.8
Classroom 222	9	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	9	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.3	1,035	0	$133	$493	$135	2.7
Classroom 223	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	575	0	$74	$274	$75	2.7
Classroom 223	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Classroom 224	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	575	0	$74	$274	$75	2.7
Classroom 224	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Computer Lab 201	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Computer Lab 201	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Computer Lab 202	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Computer Lab 202	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Corridor 2nd Floor	73	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Other	S	42	3,315	2, 3	Relamp	Yes	73	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,287	1.1	5,670	-1	$726	$3,911	$2,628	1.8
Corridor 2nd Floor	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 2nd Floor	80	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Other	S	32	3,315	2, 3	Relamp	Yes	80	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,287	1.3	6,416	-1	$822	$4,611	$3,200	1.7
Electrical Room 2nd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.0	65	0	$8	$37	$10	3.2
Electrical Room 2nd Floor #2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.1	165	0	$21	$189	$40	7.1
Exterior 2nd Floor	8	Metal Halide: (1) 100W Lamp	Timeclock		128	2,300	1	Fixture Replacement	No	8	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	30	2,300	0.0	1,803	0	$234	$2,101	$400	7.3
Janitorial Closet 2nd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.0	65	0	$8	$37	$10	3.2
Library	1	Compact Fluorescent: (6) 40W Biaxial Plug-In Lamps	Wall Switch	S	240	3,315	2	Relamp	No	1	LED Lamps: PL-L (Biax) Lamps	Wall Switch	168	3,315	0.1	263	0	$34	$81	$6	2.2
Library	41	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Wall Switch	S	42	3,315	2, 3	Relamp	Yes	41	LED Lamps: PL-L (Biax) Lamps	Occupancy Sensor	30	2,287	0.6	3,184	-1	$408	$1,364	$146	3.0
Library	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
Library	70	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,315	2, 3	Relamp	Yes	70	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,287	2.1	10,718	-2	$1,373	$3,906	$875	2.2
Lounge 212	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	575	0	$74	$274	$75	2.7
Lounge 212	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	530	0	$68	$434	$80	5.2

	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
MDF Room	13	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2, 3	Relamp	Yes	13	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.4	1,837	0	$235	$745	$165	2.5
Office - 200A	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	848	0	$109	$489	$95	3.6
Office - 200B	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	848	0	$109	$489	$95	3.6
Office - 214	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	460	0	$59	$219	$60	2.7
Office - 215	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	230	0	$29	$110	$30	2.7
Office - 217	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	230	0	$29	$110	$30	2.7
Office - 218	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	230	0	$29	$110	$30	2.7
Office - 219	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	424	0	$54	$226	$50	3.2
Office - 220	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	424	0	$54	$226	$50	3.2
Restroom - Female 2nd Floor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,111	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	307	0	$39	$146	$40	2.7
Restroom - Female 2nd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,550	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	2,550	0.0	93	0	$12	$37	$10	2.2
Restroom - Male 2nd Floor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,111	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	307	0	$39	$146	$40	2.7
Restroom - Male 2nd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,550	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	2,550	0.0	93	0	$12	$37	$10	2.2
Restroom 2nd Floor 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 2nd Floor 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom Library	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Server Room 2nd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Storage 210	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	247	0	$32	$226	$50	5.5
Storage 211	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	247	0	$32	$226	$50	5.5
Storage 216	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,232	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	268	0	$34	$219	$60	4.6
Storage 222a	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,785	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	371	0	$48	$280	$45	5.0
Storage 222b	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	247	0	$32	$226	$50	5.5
Classroom 300	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 300	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 301	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0

	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
Classroom 301	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 302	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 302	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 303	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 303	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 304	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 304	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 305	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 305	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 306	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 306	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 307	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 307	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 308	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	575	0	$74	$274	$75	2.7
Classroom 308	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Classroom 309	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 309	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 310	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 310	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 311	8	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	8	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.3	920	0	$118	$438	$120	2.7
Classroom 311	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Classroom 312	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Classroom 312	15	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	15	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.7	3,180	-1	$407	$1,092	$260	2.0
Classroom 312	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	530	0	$68	$434	$80	5.2
Classroom 315	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	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
Classroom 315	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 316	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Classroom 316	5	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	5	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	575	0	$74	$274	$75	2.7
Classroom 317	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 317	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 318	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 318	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 319	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 319	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 320	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 320	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 321	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 321	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 322	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	805	0	$103	$383	$105	2.7
Classroom 322	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Classroom 323	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom 323	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom 324	7	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	7	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.2	805	0	$103	$383	$105	2.7
Classroom 324	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Corridor 3rd Floor	71	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Other	S	42	3,315	2, 4	Relamp	Yes	71	LED Lamps: PL-L (Biax) Lamps	High/Low Control	30	2,287	1.1	5,515	-1	$706	$3,659	$2,556	1.6
Corridor 3rd Floor	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor 3rd Floor	75	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Other	S	32	3,315	2, 4	Relamp	Yes	75	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,287	1.2	6,015	-1	$770	$4,294	$3,000	1.7
Electrical Room 3rd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.0	65	0	$8	$37	$10	3.2
Electrical Room 3rd Floor 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.1	165	0	$21	$189	$40	7.1
Janitorial Closet 3rd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.0	65	0	$8	$37	$10	3.2

	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
Restroom - Female 3rd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,550	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	2,550	0.0	93	0	$12	$37	$10	2.2
Restroom - Female 3rd Floor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,111	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	307	0	$39	$146	$40	2.7
Restroom - Male 3rd Floor	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	2,111	2	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	307	0	$39	$146	$40	2.7
Restroom - Male 3rd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	S	62	2,550	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	None	29	2,550	0.0	93	0	$12	$37	$10	2.2
Restroom 3rd Floor 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom 3rd Floor 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Server Room 3rd Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Storage 313	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	1,232	2	Relamp	No	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,232	0.1	201	0	$26	$164	$45	4.6
Exterior	6	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Timeclock		42	4,380	2	Relamp	No	6	LED Lamps: PL-L (Biax) Lamps	Timeclock	30	4,380	0.0	315	0	$41	$81	$6	1.8
Exterior	6	Halogen Incandescent: (1) 100W Screw-in Lamps	Timeclock		100	4,380	2	Relamp	No	6	LED Lamps: A19 Lamps	Timeclock	15	4,380	0.0	2,234	0	$290	$103	$6	0.3
Exterior	36	Metal Halide: (1) 100W Lamp	Timeclock		128	4,380	1	Fixture Replacement	No	36	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	30	4,380	0.0	15,453	0	$2,007	$9,455	$1,800	3.8
Exterior	9	Metal Halide: (1) 175W Lamp	Timeclock		215	4,380	1	Fixture Replacement	No	9	LED - Fixtures: Outdoor Wall-Mounted Area Fixture	Timeclock	53	4,380	0.0	6,386	0	$830	$3,461	$450	3.6
Boiler Room	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Boiler Room	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.5	1,296	0	$166	$730	$200	3.2
Classroom G1	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom G1	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom G2	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom G2	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom G3	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom G3	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom G4	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom G4	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom G5	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom G5	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom G6a	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,380	0	$177	$657	$180	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
Classroom G6a	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom G7	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	1,760	0.1	353	0	$45	$380	$65	7.0
Classroom G7	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.4	1,150	0	$147	$548	$150	2.7
Classroom G9	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	None	S	93	2,550	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	None	44	2,550	0.0	139	0	$18	$55	$15	2.2
Classroom G9	4	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	S	93	2,111	2	Relamp	No	4	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	460	0	$59	$219	$60	2.7
Corridor Ground	54	Compact Fluorescent: (1) 42W Triple Biaxial Plug-In Lamp	Other	S	42	3,315	2, 4	Relamp	Yes	54	LED Lamps: PL-L (Biax) Lamps	High/Low Control	30	2,287	0.8	4,194	-1	$537	$2,754	$1,944	1.5
Corridor Ground	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
Corridor Ground	23	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Other	S	32	3,315	2, 3	Relamp	Yes	23	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,287	0.4	1,845	0	$236	$1,320	$920	1.7
Electrical - Generator Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.2	648	0	$83	$365	$100	3.2
Electrical Meter Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.3	824	0	$106	$635	$135	4.7
Garage	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
Garage	8	LED - Fixtures: Ceiling Mount	None	S	100	2,550	3	None	Yes	8	LED - Fixtures: Ceiling Mount	Occupancy Sensor	100	1,760	0.2	696	0	$89	$270	$35	2.6
Garage	12	LED - Fixtures: Ceiling Mount	Wall Switch	S	100	3,060	3	None	Yes	12	LED - Fixtures: Ceiling Mount	Occupancy Sensor	100	2,111	0.3	1,252	0	$160	$270	$35	1.5
Garage	4	Metal Halide: (1) 100W Lamp	Timeclock	S	128	2,300	1	Fixture Replacement	No	4	LED - Fixtures: High-Bay	Timeclock	30	2,300	0.3	992	0	$127	$2,311	$200	16.6
Gym Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	424	0	$54	$226	$50	3.2
Gymnasium	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
Gymnasium	27	LED - Fixtures: High-Bay	Wall Switch	S	100	3,060	3	None	Yes	27	LED - Fixtures: High-Bay	Occupancy Sensor	100	2,111	0.6	2,817	-1	$361	$540	$70	1.3
Gymnasium	3	LED - Fixtures: High-Bay	None	S	100	2,550	3	None	Yes	3	LED - Fixtures: High-Bay	Occupancy Sensor	100	1,760	0.1	261	0	$33	$0	$0	0.0
Janitorial Closet Ground Floor	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	1,785	2	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	1,785	0.0	97	0	$12	$55	$15	3.2
Mechanical Elevator Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.1	194	0	$25	$110	$30	3.2
Mechanical Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	1,785	0.0	65	0	$8	$37	$10	3.2
Office - Building Supervisor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.2	848	0	$109	$489	$95	3.6
Office G8	3	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	3,060	2, 3	Relamp	Yes	3	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,111	0.1	636	0	$81	$434	$80	4.3
Restroom G6a	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom Ground 1	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9

	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
Restroom Ground 2	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom Ground 3	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Restroom Ground 4	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,060	0.0	111	0	$14	$37	$10	1.9
Server Room Ground Floor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	3,060	2, 3	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,111	0.1	283	0	$36	$189	$40	4.1
Storage - Garage	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.2	495	0	$63	$335	$60	4.3
Storage Gym 1	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.1	330	0	$42	$262	$40	5.3
Storage Gym 2	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	1,785	2, 3	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	1,232	0.1	330	0	$42	$262	$40	5.3

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
Roof	RTU 1	1	Supply Fan	50.0	94.5%	Yes	Innovent			2,310		No	94.5%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU 1	1	Exhaust Fan	25.0	93.6%	Yes	Innovent			2,310		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
Roof	RTU 2	1	Supply Fan	40.0	93.0%	No	Trane	SFHFC754M777A9BD8001AB	B	2,310	5	No	94.1%	Yes	1	11.6	28,379	0	$3,687	$13,372	$2,500	2.9
Roof	RTU 2	1	Exhaust Fan	15.0	91.7%	No	Trane	SFHFC754M777A9BD8001AB	B	2,310	5	No	93.0%	Yes	1	4.5	10,837	0	$1,408	$7,041	$1,200	4.1
Roof	RTU 3	1	Supply Fan	5.0	89.5%	No	Trane	SFHFC204L727A2BD800	B	2,730	5	No	89.5%	Yes	1	1.4	4,267	0	$554	$4,076	$900	5.7
Roof	RTU 3	1	Exhaust Fan	1.5	86.5%	No	Trane	SFHFC204L727A2BD800	B	2,730	5	No	86.5%	Yes	1	0.4	1,324	0	$172	$3,391	$75	19.3
Roof	RTU 4 Theater	1	Supply Fan	10.0	91.7%	No	Trane	SFHFC304P749A4AAD1001ABC	B	2,940	5	No	91.7%	Yes	1	2.9	8,969	0	$1,165	$5,152	$1,100	3.5
Roof	RTU 4 Theater	1	Exhaust Fan	5.0	89.5%	No	Trane	SFHFC304P749A4AAD1001ABC	B	2,940	5	No	89.5%	Yes	1	1.5	4,595	0	$597	$4,076	$900	5.3
Roof	RTU 5	1	Supply Fan	7.5	91.7%	No	Trane	SFHFC254P738A3BD1001ABD	B	2,310	5	No	91.7%	Yes	1	2.1	5,285	0	$687	$4,738	$1,000	5.4
Roof	RTU 5	1	Exhaust Fan	3.0	89.5%	No	Trane	SFHFC254P738A3BD1001ABD	B	2,310	5	No	89.5%	Yes	1	0.9	2,166	0	$281	$3,884	$200	13.1
Roof	RTU 6 Gym	1	Supply Fan	7.5	91.7%	No	Trane	SFHFC254P738A3BD1001ABD	B	3,335	5	No	91.7%	Yes	1	2.1	7,631	0	$991	$4,738	$1,000	3.8
Roof	RTU 6 Gym	1	Exhaust Fan	3.0	89.5%	No	Trane	SFHFC254P738A3BD1001ABD	B	3,335	5	No	89.5%	Yes	1	0.9	3,127	0	$406	$3,884	$200	9.1
Boiler room	Boiler room	1	Supply Fan	0.1	60.0%	No	Trane	UHSA070	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical elevator room	Mechanical elevator room	1	Supply Fan	0.1	60.0%	No	Trane	UHSA038	B	2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Various	3	Exhaust Fan	0.3	60.0%	No				2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Various	1	Exhaust Fan	0.3	60.0%	No				2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Electrical Meter Room	Various	2	Exhaust Fan	0.3	60.0%	No				2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Garage	Various	2	Exhaust Fan	0.3	60.0%	No				2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Elevator Room	Various	1	Exhaust Fan	0.3	60.0%	No				2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler	3	Heating Hot Water Pump	0.3	60.0%	No	Bell & Gossett		W	2,745		No	60.0%	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
Boiler Room	Hot water return	1	DHW Circulation Pump	0.1	60.0%	No	Taco		W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	DHW	2	DHW Circulation Pump	0.3	60.0%	No	Marathon		W	8,760		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Roof	Kitchen hood	1	Kitchen Hood Exhaust Fan	0.3	60.0%	No				5,250		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Garage	Lift gate	1	Other	0.1	60.0%	No				2,745		No	60.0%	No		0.0	0	0	$0	$0	$0	0.0
Mechanical Elevator Room	Mechanical elevator room	1	Other	20.0	72.0%	Yes				600		No	72.0%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	DHW booster pump	2	Process Pump	3.0	87.5%	Yes	Baldor	EJMM3158T	W	2,745		No	87.5%	No		0.0	0	0	$0	$0	$0	0.0
Boiler Room	Boiler	2	Heating Hot Water Pump	5.0	89.5%	No	Century	E219M2	W	2,745	6	No	89.5%	Yes	2	1.0	8,580	0	$1,115	$8,152	$1,800	5.7
Classrooms and coorridors	Classrooms and coorridors	88	Other	0.3	60.0%	No				2,310		No	60.0%	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	RTU 1	1	Package Unit	50.00	840.00	9.50	0.8 AFUE	Innovent		B		No							0.0	0	0	$0	$0	$0	0.0
Roof	RTU 2	1	Package Unit	75.00	410.00	9.50	0.82 AFUE	Trane	SFHFC754M777A9BD8001AB	B	7	Yes	1	Package Unit	75.00	410.00	12.00	0.82 Et	9.9	18,947	0	$2,461	$66,041	$5,775	24.5
Roof	RTU 3	1	Package Unit	20.00	192.70	9.50	0.82 AFUE	Trane	SFHFC204L727A2BD800	B	7	Yes	1	Package Unit	20.00	192.70	12.50	0.82 Et	3.0	5,821	0	$756	$22,041	$1,700	26.9
Roof	RTU 4 Theater	1	Package Unit	30.00	410.00	9.50	0.82 AFUE	Trane	SFHFC304P749A4AAD1001ABC	B	7	Yes	1	Package Unit	30.00	410.00	12.50	0.82 Et	4.5	8,731	0	$1,134	$30,385	$2,550	24.5
Roof	RTU 5	1	Package Unit	25.00	410.00	9.50	0.82 AFUE	Trane	SFHFC254P738A3BD1001ABD	B	7	Yes	1	Package Unit	25.00	410.00	12.50	0.82 Et	3.8	7,276	0	$945	$26,232	$2,125	25.5
Roof	RTU 6 Gym	1	Package Unit	25.00	410.00	9.50	0.82 AFUE	Trane	SFHFC254P738A3BD1001ABD	B	7	Yes	1	Package Unit	25.00	410.00	12.50	0.82 Et	3.8	7,276	0	$945	$26,232	$2,125	25.5
Boiler room	Boiler room	1	Unit Heater		49.50		0.8 AFUE	Trane	UHSA070	B		No							0.0	0	0	$0	$0	$0	0.0
Mechanical elevator room	Mechanical elevator room	1	Unit Heater		27.20		0.8 AFUE	Trane	UHSA038	B		No							0.0	0	0	$0	$0	$0	0.0
Computer Lab 201	Computer Lab 201	2	Window AC	1.25		11.30		Frigidaire	FFRE1533S	W		No							0.0	0	0	$0	$0	$0	0.0
Computer Lab 202	Computer Lab 202	2	Window AC	1.25		11.30		Frigidaire	FFRE1533S	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
Boiler room	Various	3	Non-Condensing Hot Water Boiler	638	RBI	DB0750	W		No						0.0	0	0	$0	$0	$0	0.0

Demand Control Ventilation Recommendations

		Recommendation Inputs					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Number of Zones	Cooling Capacity of Controlled System (Tons)	Electric Heating Capacity of Controlled System (kBtu/hr)	Output Heating Capacity of Controlled System (MBh)	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	RTU 1	8	1.00	50.00		840.00	0.0	0	22	$194	$1,359	$0	7.0
Roof	RTU 2	8	1.00	75.00		410.00	0.0	4,547	11	$683	$1,359	$0	2.0
Roof	RTU 3	8	1.00	20.00		192.70	0.0	1,213	5	$201	$1,359	$0	6.8
Roof	RTU 4 Theater	8	1.00	30.00		410.00	0.0	1,819	11	$329	$1,359	$0	4.1
Roof	RTU 5	8	1.00	25.00		410.00	0.0	1,516	11	$289	$1,359	$0	4.7
Roof	RTU 6 Gym	8	1.00	25.00		410.00	0.0	1,516	11	$289	$1,359	$0	4.7

Pipe Insulation Recommendations

		Recommendation Inputs			Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	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
Boiler room	Boiler	9	5	3.00	0.0	0	6	$56	$44	$10	0.6
Boiler room	DHW tank	9	3	4.00	0.0	0	4	$39	$22	$6	0.4

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
Boiler room	Various	2	Storage Tank Water Heater (> 50 Gal)	Lochinvar	EWN300PM	B		No						0.0	0	0	$0	$0	$0	0.0
Kitchen	Kitchen	1	Storage Tank Water Heater (≤ 50 Gal)	Rheem Rudd	ELD S40C	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
Restroom - Female MO, Restroom - Kitchen, Restroom - Male MO, Restroom - Nurse, Restroom 106,107,108,109,110 , 110A, 112,113	10	12	Faucet Aerator (Lavatory)	2.20	0.50	0.0	0	6	$50	$86	$43	0.9
Restroom 2nd Floor 1, 2, , Restroom 3rd Floor 1, Restroom 3rd Floor 2, Restroom G6a, Restroom Ground 1,2,3,4	10	9	Faucet Aerator (Lavatory)	2.20	0.50	0.0	1,251	0	$163	$65	$32	0.2
Library	10	1	Faucet Aerator (Kitchen)	2.20	1.50	0.0	0	0	$2	$7	$2	3.0

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	1	Cooler (35F to 55F)	Russel	AA26-87B-A	11, 12	Yes	No	Yes	0.1	1,500	0	$195	$2,281	$155	10.9
Kitchen	1	Medium Temp Freezer (0F to 30F)	Trenton	TPLP211	11, 12	Yes	Yes	No	0.1	1,157	0	$150	$1,125	$130	6.6

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
Kitchen	2	Refrigerator Chest	Powers		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Refrigerator Chest	Powers		No		No	0.0	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	Gas Convection Oven (Full Size)	Garland		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Convection Oven (Half Size)	Panasonic		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Insulated Food Holding Cabinet (1/2 Size)	Metro		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Gas Rack Oven (Single)	Garland		No		No	0.0	0	0	$0	$0	$0	0.0
Kitchen	1	Electric Steamer	MF		No		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
PS4 Albio Sires	13	Coffee Machine	200	No		
PS4 Albio Sires	109	Desktop	109	No		
PS4 Albio Sires	10	Microwave	900	No		
PS4 Albio Sires	2	Paper Shredder	200	No		
PS4 Albio Sires	67	Printer/Medium	70	No		
PS4 Albio Sires	3	Printer/Copier	200	No		
PS4 Albio Sires	1	Projector	200	No		
PS4 Albio Sires	10	Refrigerator Mini	60	No		
PS4 Albio Sires	2	Refrigerator - residential	200	No		
PS4 Albio Sires	1	Serving table	1,500	No		
PS4 Albio Sires	56	Smart Board	5	No		
PS4 Albio Sires	7	Television	100	No		
PS4 Albio Sires	1	Toaster	900	No		
PS4 Albio Sires	3	Toaster oven	1,200	No		
PS4 Albio Sires	2	Water cooler	520	No		
PS4 Albio Sires	2	Water fountain	60	No		

APPENDIX B: ENERGY STAR STATEMENT OF ENERGY PERFORMANCE

Energy use intensity (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

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ENERGY STAR® Score[1]

West New York Public School No. 4 (Albio Sires Elementary)

Primary Property Type: K-12 School
Gross Floor Area (ft²): 126,413
Built: 1906

For Year Ending: January 31, 2020
Date Generated: October 18, 2021

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
West New York Public School No. 4 (Albio Sires Elementary) 6300 Palisade Avenue West New York, New Jersey 07093	West New York Board of Education 6028 Broadway West New York, NJ 07093 (201) 553-4000	Dean Austin 6028 Broadway West New York, NJ 07093 (201) 553-4000 x 30063 daustin@wnyschools.net

Property ID: 15346976

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
47.3 kBtu/ft²

Source EUI
96.1 kBtu/ft²

Annual Energy by Fuel

Natural Gas (kBtu)	2,439,330 (41%)
Electric - Grid (kBtu)	3,353,620 (56%)
Electric - Solar (kBtu)	192,558 (3%)

National Median Comparison

National Median Site EUI (kBtu/ft²)	60.3
National Median Source EUI (kBtu/ft²)	122.3
% Diff from National Median Source EUI	-22%

Annual Emissions

Greenhouse Gas Emissions (Metric Tons CO2e/year)	459

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.