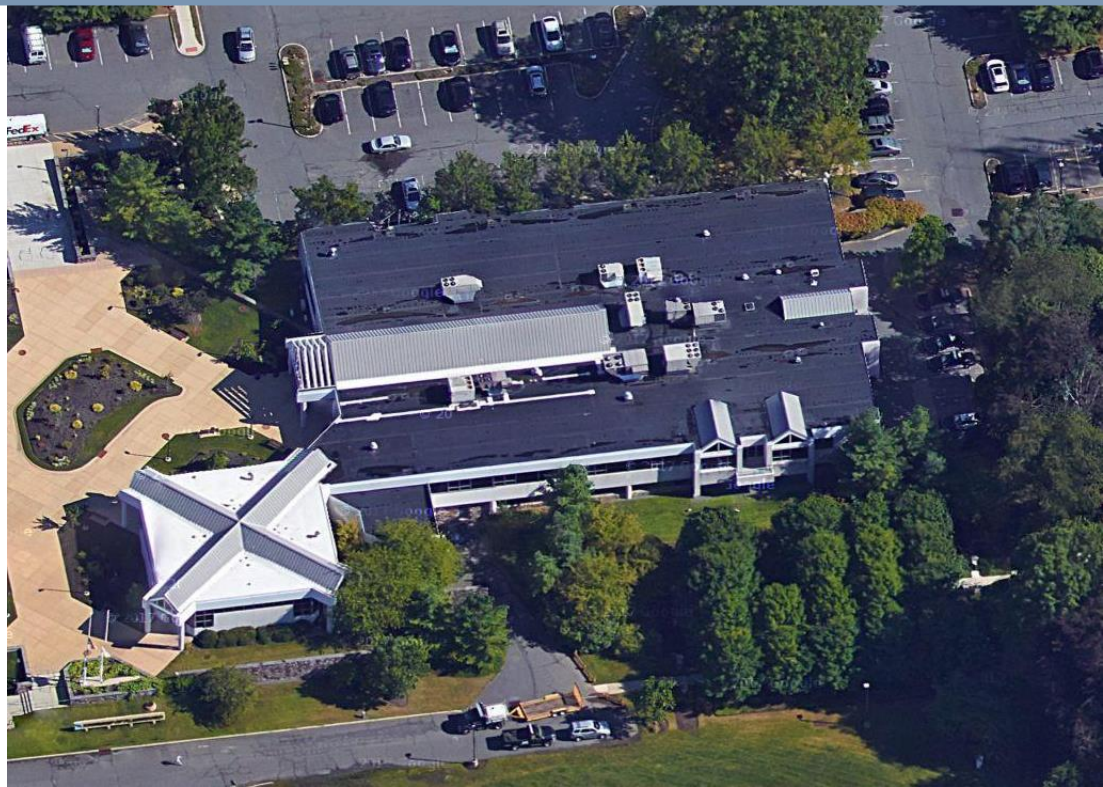




Local Government Energy Audit: Energy Audit Report



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Plainsboro Municipal Building-Police Department

641 Plainsboro Rd

Plainsboro, NJ 08536

Township of Plainsboro

September 7, 2018

Final Report by:

TRC Energy Services

Disclaimer

The intent of this energy analysis report is to identify energy savings opportunities and recommend upgrades to the facility's energy using equipment and systems. Approximate savings are included in this report to help make decisions about reducing energy use at the facility. This report, however, is not intended to serve as a detailed engineering design document. Further design and analysis may be necessary in order to implement some of the measures recommended in this report.

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

Estimated installation costs are based on TRC's experience at similar facilities, pricing from local contractors and vendors, and/or cost estimates from *RS Means*. The owner of the facility is encouraged to independently confirm these cost estimates and to obtain multiple estimates when considering measure installations. Since actual installed costs can vary widely for certain measures and conditions, TRC and NJBPU do not guarantee installed cost estimates and shall in no event be held liable should actual installed costs vary from estimates.

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

Table of Contents

1	Executive Summary.....	1
1.1	Facility Summary	1
1.2	Your Cost Reduction Opportunities.....	1
	Energy Conservation Measures.....	1
	Energy Efficient Practices	3
	On-Site Generation Measures.....	3
1.3	Implementation Planning.....	4
2	Facility Information and Existing Conditions	5
2.1	Project Contacts	5
2.2	General Site Information.....	5
2.3	Building Occupancy	5
2.4	Building Envelope	5
2.5	On-Site Generation.....	6
2.6	Energy-Using Systems	6
	Lighting System	6
	Hot Water Heating System.....	6
	Direct Expansion (DX) and Air Conditioning System	7
	Domestic Hot Water Heating System.....	8
	Building Plug Load	9
2.7	Water-Using Systems	9
3	Site Energy Use and Costs.....	10
3.1	Total Cost of Energy	10
3.2	Electricity Usage	11
3.3	Natural Gas Usage	12
3.4	Benchmarking.....	13
3.5	Energy End-Use Breakdown	14
4	Energy Conservation Measures	15
4.1	Recommended ECMs	15
4.1.1	Lighting Upgrades.....	16
	ECM 1: Install LED Fixtures	16
	ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers.....	17
	ECM 3: Retrofit Fixtures with LED Lamps.....	17
	ECM 4: Install LED Exit Signs.....	18
4.1.2	Lighting Control Measures	19
	ECM 5: Install Occupancy Sensor Lighting Controls	19
	ECM 6: Install High/Low Lighting Controls	20
4.1.3	Plug Load Equipment Control - Vending Machines.....	21
	ECM 7: Vending Machine Control	21
4.2	ECMs Evaluated But Not Recommended	22

Premium Efficiency Motors	22
Install High Efficiency Air Conditioning Units	23
Install High Efficiency Hot Water Boilers.....	24
Install High Efficiency Furnaces	25
5 Energy Efficient Practices	26
Ensure Lighting Controls Are Operating Properly	26
Clean Evaporator/Condenser Coils on AC Systems	26
Clean and/or Replace HVAC Filters	26
Perform Proper Boiler Maintenance	26
Perform Proper Furnace Maintenance	26
Perform Proper Water Heater Maintenance	27
Water Conservation	27
6 On-Site Generation Measures	28
6.1 Photovoltaic.....	28
6.2 Combined Heat and Power	30
7 Demand Response	31
8 Project Funding / Incentives	32
8.1 SmartStart	33
8.2 SREC Registration Program.....	34
8.3 Energy Savings Improvement Program	35
9 Energy Purchasing and Procurement Strategies	36
9.1 Retail Electric Supply Options.....	36
9.2 Retail Natural Gas Supply Options	36

Appendix A: Equipment Inventory & Recommendations

Appendix B: ENERGY STAR® Statement of Energy Performance

Table of Figures

Figure 1 – Previous 12 Month Utility Costs..... 2

Figure 2 – Potential Post-Implementation Costs 2

Figure 3 – Summary of Energy Reduction Opportunities 2

Figure 4 – Photovoltaic Potential..... 3

Figure 5 – Project Contacts 5

Figure 6 - Building Schedule..... 5

Figure 7 - Utility Summary 10

Figure 8 - Energy Cost Breakdown 10

Figure 9 - Electric Usage & Demand..... 11

Figure 10 - Electric Usage & Demand..... 11

Figure 11 - Natural Gas Usage..... 12

Figure 12 - Natural Gas Usage..... 12

Figure 13 - Energy Use Intensity Comparison – Existing Conditions..... 13

Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures 13

Figure 15 - Energy Balance (kBtu/SF)..... 14

Figure 16 – Summary of Recommended ECMs..... 15

Figure 17 – Summary of Lighting Upgrade ECMs..... 16

Figure 18 – Summary of Lighting Control ECMs 19

Figure 19 – Summary of Plug Load Equipment Control ECMs 21

Figure 20 – Summary of Measures Evaluated, But Not Recommended 22

Figure 21 - Photovoltaic Screening 28

Figure 22 - Combined Heat and Power Screening 30

Figure 23 - ECM Incentive Program Eligibility..... 32

I EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPUB) has sponsored this Local Government Energy Audit (LGEA) Report for the Plainsboro Municipal Building-Police Department.

The goal of an LGEA report is to provide you with information on how your facility uses energy, identify energy conservation measures (ECMs) that can reduce your energy use, and provide information and assistance to help facilities implement ECMs. The LGEA report also contains valuable information on financial incentives from New Jersey's Clean Energy Program (NJCEP) for implementing ECMs.

This study was conducted by TRC Energy Services (TRC), as part of a comprehensive effort to assist New Jersey local governments in controlling energy costs and protecting our environment by offering a wide range of energy management options and advice.

I.1 Facility Summary

The Plainsboro Municipal Building-Police Department is a 48,268 square foot facility comprised of various space types within two buildings which are connected by a walkway. The Municipal building is two floors and includes courtrooms, food pantry, conference rooms, offices, storage space, restrooms, and mechanical space. The Police Department building is two floors and includes evidence rooms, an armory, a chapel, cells, conference rooms, offices, storage space, restrooms, locker rooms, and mechanical space.

Lighting at the Plainsboro Municipal Building-Police Department consists of aging and inefficient lighting and HVAC equipment in need of replacement. A thorough description of the facility and our observations are located in Section 2.

I.2 Your Cost Reduction Opportunities

Energy Conservation Measures

TRC evaluated 11 measures, and recommends seven, which together represent an opportunity for the Plainsboro Municipal Building-Police Department to reduce annual energy costs by \$16,211 and annual greenhouse gas emissions by 110,739 lbs CO₂e. We estimate that if all measures were implemented as recommended, the project would pay for itself in 5.7 years. The breakdown of existing and potential utility costs after project implementation are illustrated in Figure 1 and Figure 2, respectively. Together these measures represent an opportunity to reduce the Plainsboro Municipal Building-Police Department's annual energy use by 7%.

Figure 1 – Previous 12 Month Utility Costs

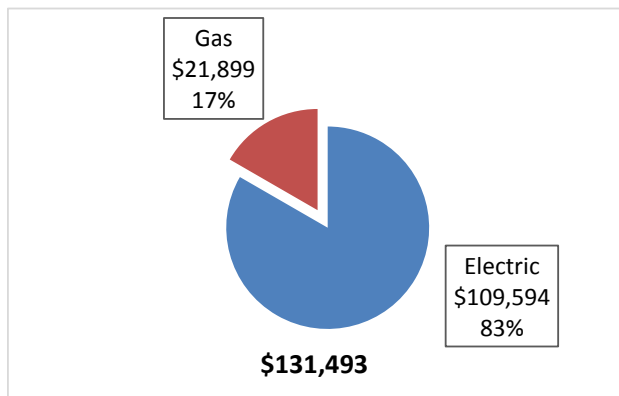
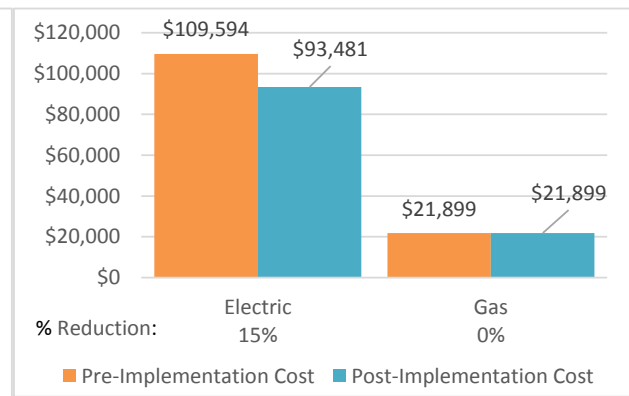


Figure 2 – Potential Post-Implementation Costs



A detailed description of the Plainsboro Municipal Building-Police Department’s existing energy use can be found in Section 3.

Estimates of the total cost, energy savings, and financial incentives for the proposed energy efficient upgrades are summarized below in Figure 3. A brief description of each category can be found below and a description of savings opportunities can be found in Section 4.

Figure 3 – Summary of Energy Reduction Opportunities

Energy Conservation Measure	Recommend?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		97,506	19.9	0.0	\$14,286.20	\$89,352.84	\$5,750.00	\$83,602.84	5.9	98,188
ECM 1	Install LED Fixtures	20,101	4.3	0.0	\$2,945.08	\$25,560.36	\$210.00	\$25,350.36	8.6	20,241
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	1,716	0.4	0.0	\$251.44	\$1,923.50	\$125.00	\$1,798.50	7.2	1,728
ECM 3	Retrofit Fixtures with LED Lamps	62,917	14.2	0.0	\$9,218.37	\$58,965.00	\$5,415.00	\$53,550.00	5.8	63,357
ECM 4	Install LED Exit Signs	12,772	1.0	0.0	\$1,871.31	\$2,903.99	\$0.00	\$2,903.99	1.6	12,861
Lighting Control Measures		7,286	1.5	0.0	\$1,067.50	\$7,628.00	\$780.00	\$6,848.00	6.4	7,337
ECM 5	Install Occupancy Sensor Lighting Controls	5,751	1.1	0.0	\$842.62	\$5,558.00	\$745.00	\$4,813.00	5.7	5,791
ECM 6	Install High/Low Lighting Controls	1,535	0.3	0.0	\$224.87	\$1,800.00	\$0.00	\$1,800.00	8.0	1,546
Motor Upgrades		1,204	0.3	0.0	\$176.37	\$3,211.00	\$0.00	\$3,211.00	18.2	1,212
	Premium Efficiency Motors	1,204	0.3	0.0	\$176.37	\$3,211.00	\$0.00	\$3,211.00	18.2	1,212
Electric Unitary HVAC Measures		8,615	5.1	0.0	\$1,262.26	\$103,070.77	\$4,883.50	\$98,187.27	77.8	8,675
	Install High Efficiency Electric AC	8,615	5.1	0.0	\$1,262.26	\$103,070.77	\$4,883.50	\$98,187.27	77.8	8,675
Gas Heating (HVAC/Process) Replacement		0	0.0	152.7	\$1,349.78	\$44,276.07	\$3,042.80	\$41,233.27	30.5	17,879
	Install High Efficiency Hot Water Boilers	0	0.0	50.6	\$447.60	\$11,377.62	\$1,042.80	\$10,334.82	23.1	5,929
	Install High Efficiency Furnaces	0	0.0	102.1	\$902.18	\$32,898.45	\$2,000.00	\$30,898.45	34.2	11,950
Plug Load Equipment Control - Vending Machine		5,178	0.0	0.0	\$758.66	\$920.00	\$0.00	\$920.00	1.2	5,214
ECM 7	Vending Machine Control	5,178	0.0	0.0	\$758.66	\$920.00	\$0.00	\$920.00	1.2	5,214
TOTALS FOR RECOMMENDED MEASURES		109,970	21.4	0.0	\$16,112.36	\$97,630.84	\$6,495.00	\$91,135.84	5.7	110,739
TOTALS FOR ALL MEASURES		119,789	26.8	152.7	\$18,900.77	\$248,458.68	\$14,456.30	\$234,002.38	12.4	138,506

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

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

Lighting Upgrades generally involve the replacement of existing lighting components such as lamps and ballasts (or the entire fixture) with higher efficiency lighting components. These measures save energy by reducing the power used by the lighting components due to improved electrical efficiency.

Lighting Controls measures generally involve the installation of automated controls to turn off lights or reduce light output when not needed. Automated control reduces reliance on occupant behavior for adjusting lights. These measures save energy by reducing the amount of time lights are on.

Motor Upgrades generally involve replacing older standard efficiency motors with high efficiency standard (NEMA Premium). Motors replacements generally assume the same size motors, just higher efficiency. Although occasionally additional savings can be achieved by downsizing motors to better meet current load requirements. This measure saves energy by reducing the power used by the motors, due to improved electrical efficiency.

Electric Unitary HVAC measures generally involve replacing older inefficient air conditioning systems with modern energy efficient systems. New air conditioning systems can provide equivalent cooling to older air condition systems at a reduced energy cost. These measures save energy by reducing the power used by the air conditioning systems, due to improved electrical efficiency.

Gas Heating (HVAC/Process) measures generally involve replacing older inefficient hydronic heating systems with modern energy efficient systems. Gas heating systems can provide equivalent heating compared to older systems at a reduced energy cost. These measures save energy by reducing the fuel demands for heating, due to improved combustion and heat transfer efficiency.

Plug Load Equipment control measures generally involve installing automated devices that limit the power usage or operation of equipment that is plugged into an electric outlets when not in use.

Energy Efficient Practices

TRC also identified seven low cost (or no cost) energy efficient practices. A facility’s energy performance can be significantly improved by employing certain behavioral or operational adjustments and by performing better routine maintenance on building systems. These practices can extend equipment lifetime, improve occupant comfort, provide better health and safety, as well as reduce annual energy and O&M costs. Potential opportunities identified at the Plainsboro Municipal Building-Police Department include:

- Ensure Lighting Controls Are Operating Properly
- Clean Evaporator/Condenser Coils on AC Systems
- Clean and/or Replace HVAC Filters
- Perform Proper Boiler Maintenance
- Perform Proper Furnace Maintenance
- Perform Proper Water Heater Maintenance
- Water Conservation

For details on these energy efficient practices, please refer to Section 5.

On-Site Generation Measures

TRC evaluated the potential for installing on-site generation for the Plainsboro Municipal Building-Police Department. Based on the configuration of the site and its loads there is a moderate potential for installing a photovoltaic (PV) array.

Figure 4 – Photovoltaic Potential

Potential	Medium	
System Potential	161	kW DC STC
Electric Generation	121,144	kWh/yr
Displaced Cost	\$10,540	/yr
Installed Cost	\$669,800	

For details on our evaluation and on-site generation potential, please refer to Section 6.

I.3 Implementation Planning

To realize the energy savings from the ECMs listed in this report, a project implementation plan must be developed. Available capital must be considered and decisions need to be made whether it is best to pursue individual ECMs separately, groups of ECMs, or a comprehensive approach where all ECMs are implemented together, possibly in conjunction with other facility upgrades or improvements.

Rebates, incentives, and financing are available from NJCEP, as well as other sources, to help reduce the costs associated with the implementation of energy efficiency projects. Prior to implementing any measure, please review the relevant incentive program guidelines before proceeding. This is important because in most cases you will need to submit applications for the incentives prior to purchasing materials or commencing with installation.

The ECMs outlined in this report may qualify under the following program(s):

- SmartStart
- SREC (Solar Renewable Energy Certificate) Registration Program (SRP)
- Energy Savings Improvement Program (ESIP)

For facilities wanting to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the SmartStart program. To participate in this program you may utilize internal resources, or an outside firm or contractor, to do the final design of the ECM(s) and do the installation. Program pre-approval is required for some SmartStart incentives, so only after receiving pre-approval should you proceed with ECM installation. The incentive estimates listed above in Figure 3 are based on the SmartStart program. More details on this program and others are available in Section 8.

For larger facilities with limited capital availability to implement ECMs, project financing may be available through the Energy Savings Improvement Program (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. An LGEA report (or other approved energy audit) is required for participation in ESIP. Please refer to Section 8.3 for additional information on the ESIP Program.

The Demand Response Energy Aggregator is a (non-NJCEP) program designed to reduce 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. Demand Response (DR) service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability. By enabling grid operators to call upon commercial facilities to reduce their electric usage 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 DR programs. Program participation is voluntary and facilities receive payments whether or not they are called upon to curtail their load during times of peak demand. Refer to Section 7 for additional information on this program.

Additional information on relevant incentive programs is located in Section 8. You may also check the following website for more details: www.njcleanenergy.com/ci.

2 FACILITY INFORMATION AND EXISTING CONDITIONS

2.1 Project Contacts

Figure 5 – Project Contacts

Name	Role	E-Mail	Phone #
Customer			
Neil Blitz	Superintendent of Public Works	nblitz@plainsboronj.com	(609) 799-0099
TRC Energy Services			
Alex Klieverik	Auditor	AKlieverik@trcsolutions.com	(732) 855-0033

2.2 General Site Information

On February 16, 2018, TRC performed an energy audit at the Plainsboro Municipal Building-Police Department located in Plainsboro, New Jersey. TRC’s team met with Albert Ortiz to review the facility operations and help focus our investigation on specific energy-using systems.

The Plainsboro Municipal Building-Police Department is a 48,268 square foot facility comprised of various space types within two buildings connected by a walkway. The Municipal Building is two floors and includes courtrooms, a food pantry, conference rooms, offices, storage space, restrooms, and mechanical space. The Police Department building is two floors and includes evidence rooms, an armory, a chapel, cells, conference rooms, offices, storage space, restrooms and locker rooms, and mechanical space.

The building was constructed in 1993. The equipment, including lighting, mechanical systems, and office equipment, has been replaced at different rates. The facility replaced most of its existing T12 fluorescent fixtures with T8 fluorescent fixtures. The majority of the furnaces and air conditioning systems were replaced within the last 12 years. The hot water boiler, two of the furnaces, and two packaged air conditioning systems are original to the building.

2.3 Building Occupancy

The Municipal Building is open Monday through Friday and the Police Department is open every day. The typical schedule is presented in the table below. The entire facility is used year round. During a typical day, the facility is occupied by 83 staff and a varying number of community members.

Figure 6 - Building Schedule

Building Name	Weekday/Weekend	Operating Schedule
Plainsboro Municipal Building - Police Department	Weekday	12:00 AM - 12:00 AM
Plainsboro Municipal Building - Police Department	Weekend	12:00 AM - 12:00 AM
Plainsboro Municipal Building - Office	Weekday	8:30 AM - 4:30 PM
Plainsboro Municipal Building - Office	Weekend	not occupied

2.4 Building Envelope

The building is constructed of concrete block and structural steel with a mixture of stone façade and stucco finish. The building has a flat roof covered with light-colored reflective membrane that is in good condition. The building has double pane windows which are in good condition and show little sign of excessive infiltration. The exterior doors are constructed of aluminum and are in good condition.

2.5 On-Site Generation

The Plainsboro Municipal Building-Police Department does not have any on-site electric generation capacity.

2.6 Energy-Using Systems

Please see Appendix A: Equipment Inventory & Recommendations for an inventory of the facility's equipment.

Lighting System

Lighting at the facility is provided mostly by 32-Watt linear fluorescent T8 lamps with electronic ballasts as well as compact fluorescent lamps (CFL). Most of the fixtures are 1-lamp or 2-lamp, 4-foot long troffers with diffusers and pin-based CFL lamps in recessed can ceiling fixtures.

Lighting control in most spaces is provided by occupancy sensors and wall switches. The occupancy sensors are either wall or ceiling mounted depending on the space layout. Stairwells, some offices, some corridors, locker rooms, and cells do not contain any occupancy sensors and are on 24 hours per day throughout the year.



Lighting in public and office spaces

The building's exterior lighting consists primarily of efficient LED fixtures in the parking lot, CFLs in the foyers, and incandescent lamps in the car cover near the police entrance. Exterior lighting is controlled by scheduling timers and photocell light sensors. The timers run from 6:00 PM to 6:00 AM.

Hot Water Heating System

The hot water system consists of one HydroTherm 474 kBtu/hr output gas-fired atmospheric boiler. The boiler has a nominal combustion efficiency of 79%. Hot water heating is supplied by two alternating 1.0 HP pumps. Hot water is supplied at 180°F. The boilers provide hot water to hydronic baseboard heaters throughout the facility.

The boiler operates on a limited schedule. The hot water system is designed to pre-warm the building prior to the rooftop units supplying most of the conditioning. The boiler turns on at 6:00 AM and shuts off when the building reaches an average indoor temperature of 68°F.

The boiler is well maintained, but at 25 years old it is at the end of its useful life and should be considered for replacement.



HydroTherm atmospheric boiler

Direct Expansion (DX) and Air Conditioning System

Ten rooftop packaged AC units (RTU1-10) with direct expansion (DX) and gas furnace components are used to condition spaces throughout the facility. The cooling capacity for these units range from 12 to 20 tons and they have an average cooling mode efficiency of 9 EER. The heating input for the rooftop units ranges from 240 kBtu/hr to 400 kBtu/hr and have an efficiency rating of 80%. RTU 3, 4, 5, 7, 8, 9, and 10 are used to condition the municipal section of the building, while RTU 1, 2, and 6 are used to condition the Police Department. Units 5, 8, and 10 provide constant volume, while remaining units provide variable air volume, with supply fan motors ranging from 1 to 7.5 HP and exhaust fans motors of less than 1 HP.

The units are controlled by programmable thermostats located in the zone. The thermostats are set to maintain a setpoint between 72°F and 73°F.

Ten cooling only split systems ranging in cooling capacity from 1 to 3 tons are used to condition the computer and IT rooms in the Municipal Building and Police Department. The fans and evaporators are located in the computer and IT rooms. The compressors and condensing units are located on the ground adjacent to the buildings.

The units are manually controlled by a thermostat located in space. The unit operates on demand to maintain a space temperature setpoint around 75°F (adjustable by staff).



Direct-expansion (DX) packaged AC units



Cooling only split systems

Domestic Hot Water Heating System

The domestic hot water heating system for the facility consists of one Bradford White gas-fired hot water heater with an input rating of 200 MBh and a nominal efficiency of 80%. The water heater has a 98 gallon storage tank. One 0.13 HP recirculation pump distributes 135°F water to the entire site. The recirculation pump operates based on an aquastat.



Bradford White gas fired hot water heater

Building Plug Load

There are 46 computer work stations throughout the facility. All of the computers are desktop units with LCD monitors. There is no centralized PC power management software installed.

The facility also has peripheral office equipment throughout, including photo copiers, desktop printers, and shredders, as well as kitchen equipment, including refrigerators, coffee makers, and dishwashers.

The facility has four vending machines, three are refrigerated and one is non-refrigerated. One of the refrigerated vending machines was unplugged during the audit.



Office and kitchen equipment

2.7 Water-Using Systems

There are ten restrooms at this facility. A sampling of restrooms found that the faucets are rated for 2.0 gallons per minute (gpm) or lower, the toilets are rated at 2.0 gallons per flush (gpf) and the urinals are rated at 1.8 gpf. There are two locker rooms with showers. The showerheads are rated at 2.5 gpm.

3 SITE ENERGY USE AND COSTS

Utility data for electricity and natural gas was analyzed to identify opportunities for savings. In addition, data for electricity and natural gas was evaluated to determine the annual energy performance metrics for the building in energy cost per square foot and energy usage per square foot. These metrics are an estimate of the relative energy efficiency of this building. There are a number of factors that could cause the energy use of this building to vary from the “typical” energy usage profile for facilities with similar characteristics. Local weather conditions, building age and insulation levels, equipment efficiency, daily occupancy hours, changes in occupancy throughout the year, equipment operating hours, and energy efficient behavior of occupants all contribute to benchmarking scores. Please refer to the Benchmarking section within Section 3.4 for additional information.

3.1 Total Cost of Energy

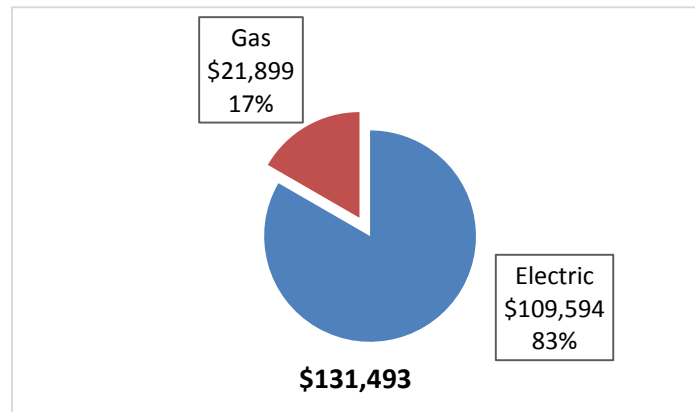
The following energy consumption and cost data is based on the last 12-month period of utility billing data that was provided for each utility. A profile of the annual energy consumption and energy cost of the facility was developed from this information.

Figure 7 - Utility Summary

Utility Summary for Plainsboro Municipal Building-Police Department		
Fuel	Usage	Cost
Electricity	748,000 kWh	\$109,594
Natural Gas	24,775 Therms	\$21,899
Total		\$131,493

The current annual energy cost for this facility is \$131,493 as shown in the chart below.

Figure 8 - Energy Cost Breakdown



3.2 Electricity Usage

Electricity is provided by PSE&G. The average electric cost over the past 12 months was \$0.147/kWh, which is the blended rate that includes energy supply, distribution, and other charges. This rate is used throughout the analyses in this report to assess energy costs and savings. The monthly electricity consumption and peak demand are shown in the chart below.

Figure 9 - Electric Usage & Demand

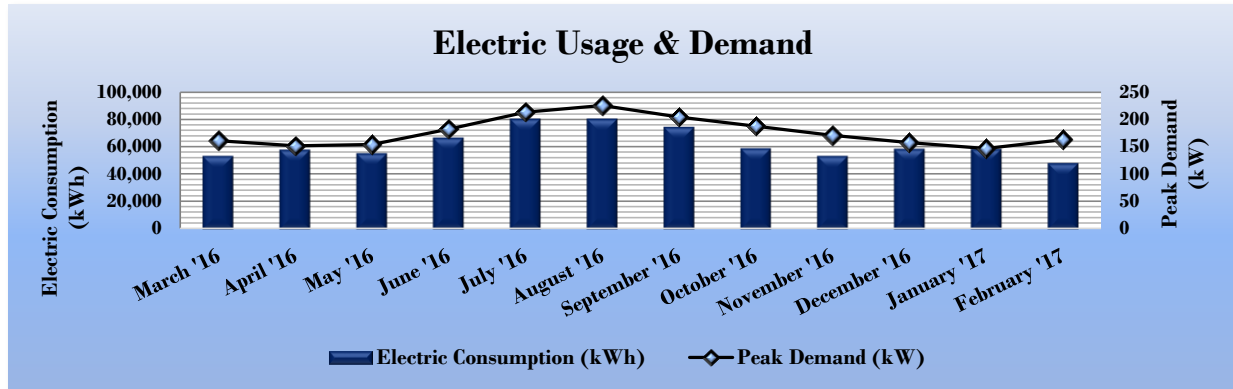


Figure 10 - Electric Usage & Demand

Electric Billing Data for Plainsboro Municipal Building-Police Department						
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost	TRC Estimated Usage?
3/18/16	26	52,872	161	\$587	\$7,244	No
4/19/16	32	57,490	152	\$555	\$7,762	No
5/18/16	29	54,924	154	\$565	\$7,467	No
6/17/16	30	66,222	182	\$667	\$10,502	No
7/18/16	31	79,678	213	\$782	\$12,489	No
8/17/16	30	79,859	226	\$827	\$12,663	No
9/16/16	30	73,778	205	\$756	\$11,701	No
10/17/16	31	58,374	188	\$694	\$9,258	Yes
11/15/16	29	52,841	171	\$637	\$7,161	No
12/16/16	31	57,992	157	\$586	\$7,760	No
1/19/17	34	58,010	147	\$545	\$7,768	No
2/16/17	28	47,763	163	\$605	\$6,617	No
Totals	361	739,803	225.7	\$7,806	\$108,393	
Annual	365	748,000	225.7	\$7,893	\$109,594	

3.3 Natural Gas Usage

Natural gas is provided by PSE&G. The average gas cost for the past 12 months is \$0.884/therm, which is the blended rate used throughout the analyses in this report. The monthly gas consumption is shown in the chart below.

Figure 11 - Natural Gas Usage

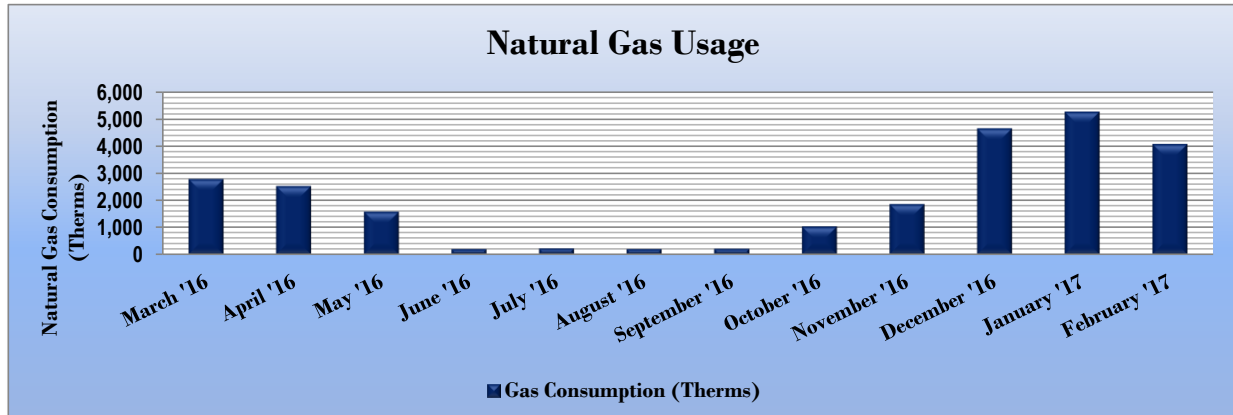


Figure 12 - Natural Gas Usage

Gas Billing Data for Plainsboro Municipal Building-Police Department				
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost	TRC Estimated Usage?
3/18/16	28	2,791	\$2,240	No
4/19/16	32	2,528	\$1,358	No
5/18/16	29	1,585	\$916	No
6/17/16	30	200	\$210	No
7/19/16	32	220	\$233	No
8/17/16	29	200	\$227	No
9/16/16	30	209	\$233	No
10/9/16	23	1,033	\$1,134	Yes
11/15/16	37	1,857	\$2,039	No
12/16/16	31	4,663	\$4,148	No
1/19/17	34	5,277	\$4,999	No
2/16/17	28	4,077	\$4,043	No
Totals	363	24,639	\$21,779	
Annual	365	24,775	\$21,899	

3.4 Benchmarking

This facility was benchmarked using Portfolio Manager®, an online tool created and managed by the United States Environmental Protection Agency (EPA) through the ENERGY STAR® program. Portfolio Manager® analyzes your building’s consumption data, cost information, and operational use details and then compares its performance against a national median for similar buildings of its type. Metrics provided by this analysis are Energy Use Intensity (EUI) and an ENERGY STAR® score for select building types.

The EUI is a measure of a facility’s energy consumption per square foot, and it is the standard metric for comparing buildings’ energy performance. Comparing the EUI of a building with the national median EUI for that building type illustrates whether that building uses more or less energy than similar buildings of its type on a square foot basis. 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.

Figure 13 - Energy Use Intensity Comparison – Existing Conditions

Energy Use Intensity Comparison - Existing Conditions		
	Plainsboro Municipal Building-Police Department	National Median Building Type: Municipal
Source Energy Use Intensity (kBtu/ft ²)	219.9	148.1
Site Energy Use Intensity (kBtu/ft ²)	104.2	67.3

Implementation of all recommended measures in this report would improve the building’s estimated EUI significantly, as shown in the table below:

Figure 14 - Energy Use Intensity Comparison – Following Installation of Recommended Measures

Energy Use Intensity Comparison - Following Installation of Recommended Measures		
	Plainsboro Municipal Building-Police Department	National Median Building Type: Municipal
Source Energy Use Intensity (kBtu/ft ²)	195.5	148.1
Site Energy Use Intensity (kBtu/ft ²)	96.4	67.3

Many types of commercial buildings are also eligible to receive an ENERGY STAR® score. This score is a percentile ranking from 1 to 100. It compares your building’s energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means your building performs better than 75% of all similar buildings nationwide and may be eligible for ENERGY STAR® certification. Your building is not is one of the building categories that are eligible to receive a score.

A Portfolio Manager® Statement of Energy Performance (SEP) was generated for this facility, see Appendix B: ENERGY STAR® Statement of Energy Performance.

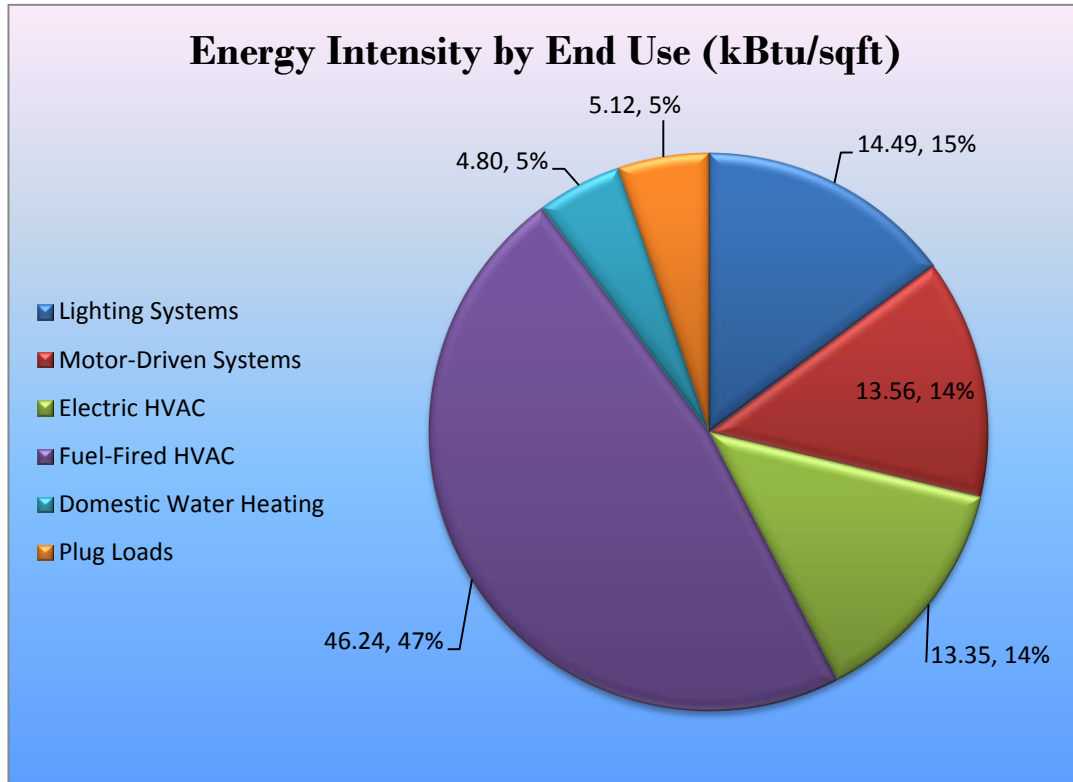
For more information on ENERGY STAR® certification go to: <https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification/how-app-1>.

A Portfolio Manager® account has been created online for your facility and you will be provided with the login information for the account. We encourage you to update your utility information in Portfolio Manager® regularly, so that you can keep track of your building’s performance. 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>.

3.5 Energy End-Use Breakdown

In order to provide a complete overview of energy consumption across building systems, an energy balance was performed at this facility. An energy balance utilizes standard practice engineering methods to evaluate all components of the various electric and fuel-fired systems found in a building to determine their proportional contribution to overall building energy usage. This chart of energy end uses highlights the relative contribution of each equipment category to total energy usage. This can help determine where the greatest benefits might be found from energy efficiency measures.

Figure 15 - Energy Balance (kBtu/SF)



4 ENERGY CONSERVATION MEASURES

The goal of this audit report is to identify potential energy efficiency opportunities, help prioritize specific measures for implementation, and provide information to the Plainsboro Municipal Building-Police Department regarding financial incentives for which they may qualify to implement the recommended measures. For this audit report, most measures have received only a preliminary analysis of feasibility which identifies expected ranges of savings and costs. This level of analysis is usually considered sufficient to demonstrate project cost-effectiveness and help prioritize energy measures. Savings are based on the New Jersey Clean Energy Program Protocols to Measure Resource Savings dated June 29, 2016, approved by the New Jersey Board of Public Utilities. Further analysis or investigation may be required to calculate more precise savings based on specific circumstances. A higher level of investigation may be necessary to support any custom SmartStart or Pay for Performance, or Direct Install incentive applications. Financial incentives for the ECMs identified in this report have been calculated based the NJCEP prescriptive SmartStart program. Some measures and proposed upgrade projects may be eligible for higher incentives than those shown below through other NJCEP programs as described in Section 8.

The following sections describe the evaluated measures.

4.1 Recommended ECMs

The measures below have been evaluated by the auditor and are recommended for implementation at the facility.

Figure 16 – Summary of Recommended ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		97,506	19.9	0.0	\$14,286.20	\$89,352.84	\$5,750.00	\$83,602.84	5.9	98,188
ECM 1	Install LED Fixtures	20,101	4.3	0.0	\$2,945.08	\$25,560.36	\$210.00	\$25,350.36	8.6	20,241
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	1,716	0.4	0.0	\$251.44	\$1,923.50	\$125.00	\$1,798.50	7.2	1,728
ECM 3	Retrofit Fixtures with LED Lamps	62,917	14.2	0.0	\$9,218.37	\$58,965.00	\$5,415.00	\$53,550.00	5.8	63,357
ECM 4	Install LED Exit Signs	12,772	1.0	0.0	\$1,871.31	\$2,903.99	\$0.00	\$2,903.99	1.6	12,861
Lighting Control Measures		7,286	1.5	0.0	\$1,067.50	\$7,358.00	\$745.00	\$6,613.00	6.2	7,337
ECM 5	Install Occupancy Sensor Lighting Controls	5,751	1.1	0.0	\$842.62	\$5,558.00	\$745.00	\$4,813.00	5.7	5,791
ECM 6	Install High/Low Lighting Controls	1,535	0.3	0.0	\$224.87	\$1,800.00	\$0.00	\$1,800.00	8.0	1,546
Plug Load Equipment Control - Vending Machine		5,178	0.0	0.0	\$758.66	\$920.00	\$0.00	\$920.00	1.2	5,214
ECM 7	Vending Machine Control	5,178	0.0	0.0	\$758.66	\$920.00	\$0.00	\$920.00	1.2	5,214
TOTALS		109,970	21.4	0.0	\$16,112.36	\$97,630.84	\$6,495.00	\$91,135.84	5.7	110,739

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

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

4.1.1 Lighting Upgrades

Our recommendations for upgrades to existing lighting fixtures are summarized in Figure 17 below.

Figure 17 – Summary of Lighting Upgrade ECMs

Energy Conservation Measure		Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Lighting Upgrades		97,506	19.9	0.0	\$14,286.20	\$89,352.84	\$5,750.00	\$83,602.84	5.9	98,188
ECM 1	Install LED Fixtures	20,101	4.3	0.0	\$2,945.08	\$25,560.36	\$210.00	\$25,350.36	8.6	20,241
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	1,716	0.4	0.0	\$251.44	\$1,923.50	\$125.00	\$1,798.50	7.2	1,728
ECM 3	Retrofit Fixtures with LED Lamps	62,917	14.2	0.0	\$9,218.37	\$58,965.00	\$5,415.00	\$53,550.00	5.8	63,357
ECM 4	Install LED Exit Signs	12,772	1.0	0.0	\$1,871.31	\$2,903.99	\$0.00	\$2,903.99	1.6	12,861

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 1: Install LED Fixtures

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	18,782	4.1	0.0	\$2,751.92	\$24,343.20	\$200.00	\$24,143.20	8.8	18,914
Exterior	1,318	0.2	0.0	\$193.16	\$1,217.16	\$10.00	\$1,207.16	6.2	1,328

Measure Description

We recommend replacing existing fixtures mercury vapor lamps with new high performance LED light fixtures. This measure saves energy by installing LEDs which use less power than other technologies with a comparable light output.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tubes and more than ten times longer than many incandescent lamps.

ECM 2: Retrofit Fluorescent Fixtures with LED Lamps and Drivers

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	1,716	0.4	0.0	\$251.44	\$1,923.50	\$125.00	\$1,798.50	7.2	1,728
Exterior	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0

Measure Description

We recommend retrofitting existing T12 fluorescent fixtures by removing fluorescent tubes and ballasts and replacing them with LEDs and LED drivers (if necessary), which are designed to be used retrofitted fluorescent fixtures. The measure uses the existing fixture housing but replaces the rest of the components with more efficient lighting technology. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tubes and more than ten times longer than many incandescent lamps.

ECM 3: Retrofit Fixtures with LED Lamps

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	61,610	14.0	0.0	\$9,026.81	\$57,943.69	\$5,390.00	\$52,553.69	5.8	62,041
Exterior	1,307	0.2	0.0	\$191.56	\$1,021.31	\$25.00	\$996.31	5.2	1,317

Measure Description

We recommend retrofitting existing T8 fluorescent, compact fluorescent, and incandescent lighting technologies with LED lamps. Many LED tube lamps are direct replacements for existing fluorescent lamps and can be installed while leaving the fluorescent fixture ballast in place. LED bulbs can be used in existing fixtures as a direct replacement for most other lighting technologies. This measure saves energy by installing LEDs which use less power than other lighting technologies yet provide equivalent lighting output for the space.

Additional savings from lighting maintenance can be anticipated since LEDs have lifetimes which are more than twice that of a fluorescent tubes and more than ten times longer than many incandescent lamps.

ECM 4: Install LED Exit Signs

Summary of Measure Economics

Interior/ Exterior	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Interior	12,772	1.0	0.0	\$1,871.31	\$2,903.99	\$0.00	\$2,903.99	1.6	12,861
Exterior	0	0.0	0.0	\$0.00	\$0.00	\$0.00	\$0.00	0.0	0

Measure Description

We recommend replacing all incandescent or compact fluorescent exit signs with LED exit signs. LED exit signs require virtually no maintenance and have a life expectancy of at least 20 years. This measure saves energy by installing LED fixtures, which use less power than other technologies with an equivalent lighting output.

4.1.2 Lighting Control Measures

Our recommendations for upgrades to existing lighting controls are summarized in Figure 18 below.

Figure 18 – Summary of Lighting Control ECMs

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
Lighting Control Measures	7,286	1.5	0.0	\$1,067.50	\$7,358.00	\$745.00	\$6,613.00	6.2	7,337
ECM 5 Install Occupancy Sensor Lighting Controls	5,751	1.1	0.0	\$842.62	\$5,558.00	\$745.00	\$4,813.00	5.7	5,791
ECM 6 Install High/Low Lighting Controls	1,535	0.3	0.0	\$224.87	\$1,800.00	\$0.00	\$1,800.00	8.0	1,546

During lighting upgrade planning and design, we recommend a comprehensive approach that considers both the efficiency of the lighting fixtures and how they are controlled.

ECM 5: Install Occupancy Sensor Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
5,751	1.1	0.0	\$842.62	\$5,558.00	\$745.00	\$4,813.00	5.7	5,791

Measure Description

We recommend installing occupancy sensors to control lighting fixtures that are currently controlled by manual switches in all offices, conference rooms, storage rooms, and corridors. Lighting sensors detect occupancy using ultrasonic and/or infrared sensors. For most spaces, we recommend lighting controls use dual technology sensors, which can eliminate the possibility of any lights turning off unexpectedly. Lighting systems are enabled when an occupant is detected. Fixtures are automatically turned off after an area has been vacant for a preset period. Some controls also provide dimming options and all modern occupancy controls can be easily over-ridden by room occupants to allow them to manually turn fixtures on or off, as desired. Energy savings results from only operating lighting systems when they are required.

Occupancy sensors may be mounted on the wall at existing switch locations, mounted on the ceiling, or in remote locations. In general, wall switch replacement sensors are recommended for single occupant offices and other small rooms. Ceiling-mounted or remote mounted sensors are used in locations without local switching or where wall switches are not in the line-of-sight of the main work area and in large spaces. We recommend a comprehensive approach to lighting design that upgrades both the lighting fixtures and the controls together for maximum energy savings and improved lighting for occupants.

ECM 6: Install High/Low Lighting Controls

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
1,535	0.3	0.0	\$224.87	\$1,800.00	\$0.00	\$1,800.00	8.0	1,546

Measure Description

We recommend installing 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. Typical areas for such lighting control are stairwells, interior corridors, parking lots, and parking garages.

Lighting fixtures with these controls operate at default low levels when the area is not occupied to provide minimal lighting to meet security or safety requirements. Sensors detect occupancy using ultrasonic and/or infrared sensors. The lighting systems are switched to full lighting levels whenever an occupant is detected. Fixtures are automatically switched back to low level after an area has been vacant for a preset period of time. Energy savings results from only providing full lighting levels when it is required.

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

Additional savings from reduced lighting maintenance may also result from this measure, due to reduced lamp operation.

4.1.3 Plug Load Equipment Control - Vending Machines

Our recommendations for upgrades to existing plug load equipment controls are summarized in Figure 19 below.

Figure 19 – Summary of Plug Load Equipment Control ECMs

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Plug Load Equipment Control - Vending Machine	5,178	0.0	0.0	\$758.66	\$920.00	\$0.00	\$920.00	1.2	5,214
ECM 7 Vending Machine Control	5,178	0.0	0.0	\$758.66	\$920.00	\$0.00	\$920.00	1.2	5,214

ECM 7: Vending Machine Control

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
5,178	0.0	0.0	\$758.66	\$920.00	\$0.00	\$920.00	1.2	5,214

Measure Description

Vending machines operate continuously, even during non-business hours. We recommend installing occupancy sensor controls to reduce the energy use. These controls power down vending machines when the vending machine area has been vacant for some time, then power up at regular intervals, as needed, to turn machine lights on or keep the product cool. Energy savings are a dependent on vending machine and activity level in the area surrounding the machines.

4.2 ECMs Evaluated But Not Recommended

The measures below have been evaluated by the auditor but are not recommended for implementation at the facility. Reasons for exclusion can be found in each measure description section.

Figure 20 – Summary of Measures Evaluated, But Not Recommended

Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)*	Estimated Net Cost (\$)	Simple Payback Period (yrs)**	CO ₂ e Emissions Reduction (lbs)
Motor Upgrades	1,204	0.3	0.0	\$176.37	\$3,211.00	\$0.00	\$3,211.00	18.2	1,212
Premium Efficiency Motors	1,204	0.3	0.0	\$176.37	\$3,211.00	\$0.00	\$3,211.00	18.2	1,212
Electric Unitary HVAC Measures	8,615	5.1	0.0	\$1,262.26	\$103,070.77	\$4,883.50	\$98,187.27	77.8	8,675
Install High Efficiency Electric AC	8,615	5.1	0.0	\$1,262.26	\$103,070.77	\$4,883.50	\$98,187.27	77.8	8,675
Gas Heating (HVAC/Process) Replacement	0	0.0	152.7	\$1,349.78	\$44,276.07	\$3,042.80	\$41,233.27	30.5	17,879
Install High Efficiency Hot Water Boilers	0	0.0	50.6	\$447.60	\$11,377.62	\$1,042.80	\$10,334.82	23.1	5,929
Install High Efficiency Furnaces	0	0.0	102.1	\$902.18	\$32,898.45	\$2,000.00	\$30,898.45	34.2	11,950
TOTALS	9,819	5.4	152.7	\$2,788.41	\$150,557.84	\$7,926.30	\$142,631.54	51.2	27,767

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

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

Premium Efficiency Motors

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
1,204	0.3	0.0	\$176.37	\$3,211.00	\$0.00	\$3,211.00	18.2	1,212

Measure Description

We recommend replacing standard efficiency motors with *NEMA Premium™* efficiency motors. Our evaluation assumes that existing motors will be replaced with motors of equivalent size and type. Although occasionally additional savings can be achieved by downsizing motors to better meet the motor's current load requirements. The base case motor efficiencies are estimated from nameplate information and our best estimates of motor run hours. Efficiencies of proposed motor upgrades are obtained from the *New Jersey's Clean Energy Program Protocols to Measure Resource Savings (2016)*. Savings are based on the difference between baseline and proposed efficiencies and the assumed annual operating hours.

Reasons for not Recommending

All equipment operating toward the end of its useful life was evaluated for replacement. Replacement of the motors would not be cost effective on the basis of the potential energy savings. We recommend that when the existing motors are ready for replacement, they are replaced with high efficiency units.

Install High Efficiency Air Conditioning Units

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
8,615	5.1	0.0	\$1,262.26	\$103,070.77	\$4,883.50	\$98,187.27	77.8	8,675

Measure Description

We recommend replacing standard efficiency packaged air conditioning units with high efficiency packaged air conditioning units. There have been significant improvements in both compressor and fan motor efficiencies over the past several years. Therefore, electricity savings can be achieved by replacing older units with new high efficiency units. A higher EER or SEER rating indicates a more efficient cooling system. 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 load, and the estimated annual operating hours.

Reasons for not Recommending

All equipment operating toward the end of its useful life was evaluated for replacement. Replacement of the packaged air conditioning units would not be cost effective on the basis of the potential energy savings. We recommend that when the existing packaged air conditioning are ready for replacement, they are replaced with high efficiency units.

Install High Efficiency Hot Water Boilers

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
0	0.0	50.6	\$447.60	\$11,377.62	\$1,042.80	\$10,334.82	23.1	5,929

Measure Description

We recommend replacing older inefficient hot water boilers with high efficiency hot water boilers. Significant improvements have been made in combustion technology resulting in increased overall boiler efficiency. Energy savings results from improved combustion efficiency and reduced standby losses at low loads.

The most notable efficiency improvement is condensing hydronic boilers that can achieve over 90% efficiency under the proper conditions. Condensing hydronic boilers typically operate at efficiencies between 85% and 87% (comparable to other high efficiency boilers) when the return water temperature is above 130°F. The boiler efficiency increases as the return water temperature drops below 130°F. Therefore, condensing hydronic boilers were only evaluated when the return water temperature is less than 130°F during most of the operating hours. As a result, condensing hydronic boilers are not recommended for this site.

Reasons for not Recommending

All equipment operating toward the end of it useful life was evaluated for replacement. Replacement of the hot water boiler would not be cost effective on the basis of the potential energy savings. We recommend that when the existing hot water boiler is ready for replacement, it are replaced with a high efficiency unit.

Install High Efficiency Furnaces

Summary of Measure Economics

Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings (\$)	Estimated Install Cost (\$)	Estimated Incentive (\$)	Estimated Net Cost (\$)	Simple Payback Period (yrs)	CO ₂ e Emissions Reduction (lbs)
0	0.0	102.1	\$902.18	\$32,898.45	\$2,000.00	\$30,898.45	34.2	11,950

Measure Description

We recommend replacing existing standard efficiency packaged ACs with gas furnaces with condensing one. Improved combustion technology and heat exchanger design optimize heat recovery from the combustion gases which can significantly improve furnace efficiency. Savings result from improved system efficiency.

Reasons for not Recommending

All equipment operating toward the end of its useful life was evaluated for replacement. Replacement of the packaged ACs with gas furnaces would not be cost effective on the basis of the potential energy savings. We recommend that when the existing packaged ACs with gas furnaces are ready for replacement, they are replaced with high efficiency units.

5 ENERGY EFFICIENT PRACTICES

In addition to the quantifiable savings estimated in Section 4, a facility's energy performance can also be improved through application of many low cost (or no-cost) energy efficiency strategies. By employing certain behavioral and operational changes and performing routine maintenance on building systems, equipment lifetime can be extended; occupant comfort, health and safety can be improved; and energy and O&M costs can be reduced. The recommendations below are provided as a framework for developing a whole building maintenance plan that is customized to your facility. Consult with qualified equipment specialists for details on proper maintenance and system operation.

Ensure Lighting Controls Are Operating Properly

Lighting controls are very cost effective energy efficient devices, when installed and operating correctly. As part of a lighting maintenance schedule, lighting controls should be tested annually to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight sensors, maintenance involves cleaning of sensor lenses and confirming setpoints and sensitivity are appropriately configured.

Clean Evaporator/Condenser Coils on AC Systems

Dirty evaporators and condensers coils cause a restriction to air flow and restrict heat transfer. This results in increased evaporator and condenser fan load and a decrease in cooling system performance. Keeping the coils clean allows the fans and cooling system to operate more efficiently.

Clean and/or Replace HVAC Filters

Air filters work to reduce the amount of indoor air pollution and increase occupant comfort. Over time, filters become less and less effective as particulate buildup increases. In addition to health concerns related to clogged filters, filters that have reached saturation also restrict air flow through the facility's air conditioning or heat pump system, increasing the load on the distribution fans and decreasing occupant comfort levels. Filters should be checked monthly and cleaned or replaced when appropriate.

Perform Proper Boiler Maintenance

Many boiler problems develop slowly over time, so regular inspection and maintenance is essential to retain proper functionality and efficiency of the heating system. Fuel burning equipment should undergo yearly tune-ups to ensure they are operating as safely and efficiently as possible from a combustion standpoint. A tune-up should include a combustion analysis to analyze the exhaust from the boilers and to ensure the boiler is operating safely. Buildup of dirt, dust, or deposits on the internal surfaces of a boiler can greatly affect its heat transfer efficiency. These deposits can accumulate on the water side or fire side of the boiler. Boilers should be cleaned regularly according to the manufacturer's instructions to remove this build up in order to sustain efficiency and equipment life.

Perform Proper Furnace Maintenance

Preventative furnace maintenance can extend the life of the system, maintain energy efficiency, and ensure safe operation. Following the manufacturer's instructions, a yearly tune-up should include tasks such as checking for gas/carbon monoxide leaks; changing the air and fuel filters; checking components for cracks, corrosion, dirt, or debris build-up; ensuring the ignition system is working properly; testing and adjusting operation and safety controls; inspecting the electrical connections; and ensuring proper lubrication for motors and bearings.

Perform Proper Water Heater Maintenance

At least once a year, 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. Once a year check for any leaks or heavy corrosion on the pipes and valves. For gas water heaters, check the draft hood and make sure it is placed properly, with a few inches of air space between the tank and where it connects to the vent. Look for any 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 any 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 over three to four years old have a technician inspect the sacrificial anode annually.

Water Conservation

Installing low-flow faucets or faucet aerators, low-flow showerheads, and kitchen sink pre-rinse spray valves saves both energy and water. These devices save energy by reducing the overall amount of hot water used hence reducing the energy used to heat the water. The flow ratings for EPA WaterSense™ (<http://www3.epa.gov/watersense/products>) labeled devices are 1.5 gpm for bathroom faucets, 2.0 gpm for showerheads, and 1.28 gpm for pre-rinse spray valves.

Installing dual flush or low-flow toilets and low-flow or waterless urinals are additional ways to reduce the sites water use, however, these devices do not provide energy savings at the site level. 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. The EPA WaterSense™ ratings for urinals is 0.5 gpf and toilets that use as little as 1.28 gpf (this is lower than the current 1.6 gpf federal standard).

6 ON-SITE GENERATION MEASURES

On-site generation measure options include both renewable (e.g., solar, wind) and non-renewable (e.g., fuel cells) on-site technologies that generate power to meet all or a portion of the electric energy needs of a facility, often repurposing any waste heat where applicable. Also referred to as distributed generation, these systems contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization.

The State of New Jersey’s Energy Master Plan (EMP) encourages new distributed generation of all forms and specifically focuses on expanding use of combined heat and power (CHP) by reducing financial, regulatory and technical barriers and identifying opportunities for new entries. The EMP also outlines a goal of 70% of the State’s electrical needs to be met by renewable sources by 2050.

Preliminary screenings were performed to determine the potential that a generation project could provide a cost-effective solution for your facility. Before making a decision to implement, a feasibility study should be conducted that would take a detailed look at 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.

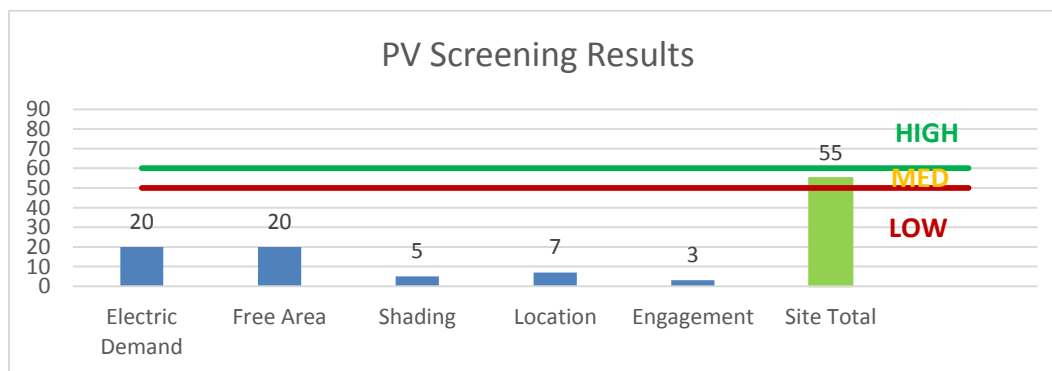
6.1 Photovoltaic

Sunlight can be converted into electricity using photovoltaics (PV) modules. Modules are racked together into an array that produces direct current (DC) electricity. The DC current is converted to alternating current (AC) through an inverter. The inverter is interconnected to the facility’s electrical distribution system. The amount of unobstructed area available determines how large of a solar array can be installed. The size of the array combined with the orientation, tilt, and shading elements determines the energy produced.

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

The amount of free area, ease of installation (location), and the lack of shading elements contribute to the potential for PV at the site. A PV array located on the roof of the main building/ground next to the building/over the main parking lot may be feasible. If the Plainsboro Municipal Building-Police Department is interested in pursuing the installation of PV, we recommended a full feasibility study be conducted.

Figure 21 - Photovoltaic Screening



Potential	Medium	
System Potential	161	kW DC STC
Electric Generation	121,144	kWh/yr
Displaced Cost	\$10,540	/yr
Installed Cost	\$669,800	

Solar projects must register their projects in the SREC (Solar Renewable Energy Certificate) Registration Program (SRP) prior to the start of construction in order to establish the project’s eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about developed new solar projects and insight into future SREC pricing. Refer to Section 8.2 for additional information.

For more information on solar PV technology and commercial solar markets in New Jersey, or to find a qualified solar installer, who can provide a more detailed assessment of the specific costs and benefits of solar develop of the site, please visit the following links below:

- **Basic Info on Solar PV in NJ:** <http://www.njcleanenergy.com/whysolar>
- **NJ Solar Market FAQs:** <http://www.njcleanenergy.com/renewable-energy/program-updates-and-background-information/solar-transition/solar-market-faqs>
- **Approved Solar Installers in the NJ Market:** http://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) is the on-site generation of electricity along with the recovery of heat energy, which is put to beneficial use. Common technologies for CHP include reciprocating engines, microturbines, fuel cells, backpressure steam turbines, and (at large facilities) gas turbines. Electric generation from a CHP system is typically interconnected to local power distribution systems. Heat is recovered from exhaust and ancillary cooling systems and interconnected to the existing hot water (or steam) distribution systems.

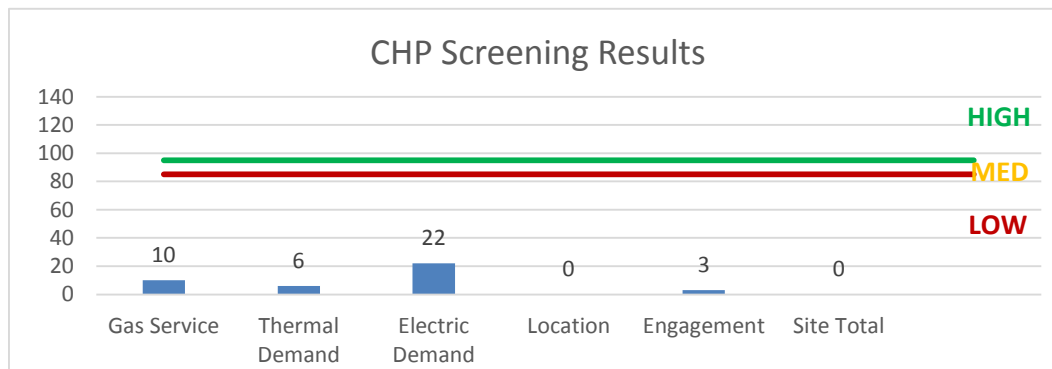
CHP systems are typically used to produce a portion of the electric power used onsite by a facility, with the balance of electric power needs supplied by grid purchases. The heat is used to supplement (or supplant) existing boilers for the purpose of space heating and/or domestic hot water heating. Waste heat can also be routed through absorption chillers for the purpose of space cooling. The key criteria used for screening, however, is the amount of time the system operates at full load and the facility's ability to use the recovered heat. Facilities with continuous use 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 a Low potential for installing a cost-effective CHP system.

Lack of gas service, low or infrequent thermal load, and lack of space near the existing boilers are the most significant factors contributing to the potential for CHP at the site. In our opinion, the facility does not appear to meet the minimum requirements for a cost-effective CHP installation.

For a list of qualified firms in New Jersey specializing in commercial CHP cost assessment and installation, go to: http://www.njcleanenergy.com/commercial-industrial/programs/nj-smartstart-buildings/tools-and-resources/tradeally/approved_vendorsearch/.

Figure 22 - Combined Heat and Power Screening



7 DEMAND RESPONSE

Demand Response (DR) is a program designed to reduce the electric load of commercial facilities when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Demand Response service providers (a.k.a. Curtailment Service Providers) are registered with PJM, the independent system operator (ISO) for mid-Atlantic state region that is charged with maintaining electric grid reliability.

By enabling grid operators to call upon Curtailment Service Providers and commercial facilities to reduce electric usage 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 DR programs. Program participation is voluntary and participants receive payments whether or not their facility is called upon to curtail their electric usage.

Typically an electric customer needs to be capable of reducing their electric demand, within minutes, by at least 100 kW or more in order to participate in a DR program. Customers with a greater capability to quickly curtail their demand during peak hours will receive higher payments. Customers with back-up generators onsite may also receive additional DR payments for their generating capacity if they agree to run the generators for grid support when called upon. Eligible customers who have chosen to participate in a DR programs often find it to be a valuable source of revenue for their facility because the payments can significantly offset annual electric costs.

Participating customers can often quickly reduce their peak load through simple measures, such as temporarily raising temperature set points on thermostats, so that air conditioning units run less frequently, or agreeing to dim or shut off less critical lighting. This usually requires some level of building automation and controls capability to ensure rapid load reduction during a DR curtailment event. DR program participants may need to install smart meters or may need to also sub-meter larger energy-using equipment, such as chillers, in order to demonstrate compliance with DR program requirements.

DR does not include the reduction of electricity consumption based on normal operating practice or behavior. For example, if a company's normal schedule is to close for a holiday, the reduction of electricity due to this closure or scaled-back operation is not considered a demand response activity in most situations.

The first step toward participation in a DR program is to contact a Curtailment Service Provider. A list of these providers is available on PJM's website and it includes contact information for each company, as well as the states where they have active business (<http://www.pjm.com/markets-and-operations/demand-response/csps.aspx>). PJM also posts training materials that are developed for program members interested in specific rules and requirements regarding DR activity (<http://www.pjm.com/training/training%20material.aspx>), along with a variety of other DR program information.

Curtailment Service Providers typically offer free assessments to determine a facility's eligibility to participate in a DR program. They will provide details regarding program rules and requirements for metering and controls, assess a facility's ability to temporarily reduce electric load, and provide details on payments to be expected for participation in the program. Providers usually offer multiple options for DR to larger facilities and may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

8 PROJECT FUNDING / INCENTIVES

The NJCEP is able to provide the incentive programs described below, and other benefits to ratepayers, because of the Societal Benefits Charge (SBC) Fund. The SBC was created by the State of New Jersey’s Electricity Restructuring Law (1999), which requires all customers of investor-owned electric and gas utilities to pay a surcharge on their monthly energy bills. As a customer of a state-regulated electric or gas utility and, therefore a contributor to the fund, your organization is eligible to participate in the LGEA program and also eligible to receive incentive payment for qualifying energy efficiency measures. Also available through the NJBPU are some alternative financing programs described later in this section. Please refer to Figure 23 for a list of the eligible programs identified for each recommended ECM.

Figure 23 - ECM Incentive Program Eligibility

Energy Conservation Measure		SmartStart Prescriptive	SmartStart Custom	Direct Install	Pay For Performance Existing Buildings	Large Energy Users Program	Combined Heat & Power and Fuel Cell
ECM 1	Install LED Fixtures	x					
ECM 2	Retrofit Fluorescent Fixtures with LED Lamps and Drivers	x					
ECM 3	Retrofit Fixtures with LED Lamps	x					
ECM 4	Install LED Exit Signs						
ECM 5	Install Occupancy Sensor Lighting Controls	x					
ECM 6	Install High/Low Lighting Controls						
ECM 7	Vending Machine Control	x					

SmartStart is generally well-suited for implementation of individual measures or small group of measures. It provides flexibility to install measures at your own pace using in-house staff or a preferred contractor. Direct Install caters to small to mid-size facilities that can bundle multiple ECMs together. This can greatly simplify participation and may lead to higher incentive amounts, but requires the use of pre-approved contractors. The Pay for Performance program is a “whole-building” energy improvement program designed for larger facilities. It requires implementation of multiple measures meeting minimum savings thresholds, as well as use of pre-approved consultants. The Large Energy Users Program (LEUP) is available to New Jersey’s largest energy users giving them flexibility to install as little or as many measures, in a single facility or several facilities, with incentives capped based on the entity’s annual energy consumption. LEUP applicants can use in-house staff or a preferred contractor.

Generally, the incentive values provided throughout the report assume the SmartStart program is utilized because it provides a consistent basis for comparison of available incentives for various measures, though in many cases incentive amounts may be higher through participation in other programs.

Brief descriptions of all relevant financing and incentive programs are located in the sections below. Further information, including most current program availability, requirements, and incentive levels can be found at: www.njcleanenergy.com/ci.

8.1 SmartStart

Overview

The SmartStart program offers incentives for installing prescriptive and custom energy efficiency measures at your facility. Routinely the program adds, removes or modifies incentives from year to year for various energy efficiency equipment based on market trends and new technologies.

Equipment with Prescriptive Incentives Currently Available:

Electric Chillers

Electric Unitary HVAC

Gas Cooling

Gas Heating

Gas Water Heating

Ground Source Heat Pumps

Lighting

Lighting Controls

Refrigeration Doors

Refrigeration Controls

Refrigerator/Freezer Motors

Food Service Equipment

Variable Frequency Drives

Most equipment sizes and types are served by this program. This program provides an effective mechanism for securing incentives for energy efficiency measures installed individually or as part of a package of energy upgrades.

Incentives

The SmartStart prescriptive incentive program provides fixed incentives for specific energy efficiency measures, whereas the custom SmartStart program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentive offerings for specific devices.

Since your facility is an existing building, only the retrofit incentives have been applied in this report. Custom measure incentives are calculated at \$0.16/kWh and \$1.60/therm based on estimated annual savings, capped at 50% of the total installed incremental project cost, or a project cost buy down to a one year payback (whichever is less). Program incentives are capped at \$500,000 per electric account and \$500,000 per natural gas account, per fiscal year.

How to Participate

To participate in the SmartStart program you will need to submit an application for the specific equipment to be installed. Many applications are designed as rebates, although others require application approval prior to installation. Applicants may work with a contractor of their choosing and can also utilize internal personnel, which provides added flexibility to the program. Using internal personnel also helps improve the economics of the ECM by reducing the labor cost that is included in the tables in this report.

Detailed program descriptions, instructions for applying and applications can be found at: www.njcleanenergy.com/SSB.

8.2 SREC Registration Program

The SREC (Solar Renewable Energy Certificate) Registration Program (SRP) is used to register the intent to install solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects MUST register their projects in the SRP prior to the start of construction in order to establish the project's eligibility to earn SRECs. Registration of the intent to participate in New Jersey's solar marketplace provides market participants with information about the pipeline of anticipated new solar capacity and insight into future SREC pricing.

After the registration is accepted, construction is complete, and final paperwork has been submitted and is deemed complete, the project is issued a New Jersey certification number which enables it to generate New Jersey SRECs. SRECs are generated once the solar project has been authorized to be energized by the Electric Distribution Company (EDC).

Each time a solar installation generates 1,000 kilowatt-hours (kWh) of electricity, an SREC is earned. Solar project owners report the energy production to the SREC Tracking System. This reporting allows SRECs to be placed in the customer's electronic account. SRECs can then be sold on the SREC Tracking System, providing revenue for the first 15 years of the project's life.

Electricity suppliers, the primary purchasers of SRECs, are required to pay a Solar Alternative Compliance Payment (SACP) if they do not meet the requirements of New Jersey's Solar RPS. One way they can meet the RPS requirements is by purchasing SRECs. As SRECs are traded in a competitive market, the price may vary significantly. The actual price of an SREC during a trading period can and will fluctuate depending on supply and demand.

Information about the SRP can be found at: www.njcleanenergy.com/srec.

8.3 Energy Savings Improvement Program

The Energy Savings Improvement Program (ESIP) is an alternate method for New Jersey's government agencies to finance the implementation of energy conservation measures. 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. This is done in a manner that ensures that annual payments are lower than the savings projected from the ECMs, ensuring that ESIP projects are cash flow positive in year one, and every year thereafter. 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 can be leveraged to help further reduce the total project cost of eligible measures.

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 utilized for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

The ESIP approach may not be appropriate for all energy conservation and energy efficiency improvements. Entities should carefully consider all alternatives to develop an approach that best meets their needs. A detailed program description and application can be found at: www.njcleanenergy.com/ESIP.

Please note that ESIP is a program delivered directly by the NJBPU and is not an NJCEP incentive program. As mentioned above, you may utilize NJCEP incentive programs to help further reduce costs when developing the ESP. You should refer to the ESIP guidelines at the link above for further information and guidance on next steps.

9 ENERGY PURCHASING AND PROCUREMENT STRATEGIES

9.1 Retail Electric Supply Options

In 1999, New Jersey State Legislature passed the Electric Discount & Energy Competition Act (EDECA) to restructure the electric power industry in New Jersey. This law deregulated the retail electric markets, allowing all consumers to shop for service from competitive electric suppliers. The intent was to create a more competitive market for electric power supply in New Jersey. As a result, utilities were allowed to charge Cost of Service and customers were given the ability to choose a third party (i.e., non-utility) energy supplier.

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

If your facility is not purchasing electricity from a third party supplier, consider shopping for a reduced rate from third party electric suppliers. If your facility is purchasing electricity from a third party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third party electric suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

9.2 Retail Natural Gas Supply Options

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

A customer's decision about whether to buy natural gas from a retail supplier is typically dependent upon whether a customer seeks 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 is not purchasing natural gas from a third party supplier, consider shopping for a reduced rate from third party natural gas suppliers. If your facility is purchasing natural gas from a third party supplier, review and compare prices at the end of the current contract or every couple years.

A list of third party natural gas suppliers, who are licensed by the state to provide service in New Jersey, can be found online at: www.state.nj.us/bpu/commercial/shopping.html.

Appendix A: Equipment Inventory & Recommendations

Lighting Inventory & Recommendations

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.11	515	0.0	\$75.43	\$292.50	\$50.00	3.22
IT Toom	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.13	422	0.0	\$61.77	\$292.50	\$50.00	3.93
Court Records Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	337	0.0	\$49.42	\$234.00	\$40.00	3.93
Interview Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Elevator Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Women's Restroom	1	Compact Fluorescent: Pin style - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Men's Restroom	1	Compact Fluorescent: Pin style - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Storage Rec. Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	337	0.0	\$49.42	\$234.00	\$40.00	3.93
Storage Purchasing	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Stairwell 1	3	Incandescent 60W - 1L	None	60	8,760	Relamp	No	3	LED Screw-In Lamps: Screw-in LED	None	9	8,760	0.12	1,568	0.0	\$229.76	\$161.26	\$15.00	0.64
Stairwell 1	2	Compact Fluorescent: 13W - 2L (wall pack)	None	13	8,760	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	None	9	8,760	0.01	80	0.0	\$11.71	\$215.01	\$0.00	18.36
Court Administrator Office	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Court Administrator Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.26	843	0.0	\$123.55	\$585.00	\$100.00	3.93
Court Administrator Office	2	Incandescent: Flood Lights	Occupancy Sensor	65	2,184	Relamp	No	2	LED Screw-In Lamps: Flood Light	Occupancy Sensor	10	2,184	0.09	282	0.0	\$41.37	\$156.51	\$10.00	3.54
Court Administrator Office	1	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Occupancy Sensor	25	2,184	Relamp & Reballast	No	1	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,184	0.01	42	0.0	\$6.18	\$93.50	\$5.00	14.33
Court Administrator Office	4	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Occupancy Sensor	46	2,184	Relamp & Reballast	No	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.10	322	0.0	\$47.17	\$392.00	\$20.00	7.89
Court Administrator Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Court Administrator Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Tax Office	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Tax Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	2,184	Relamp	No	10	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,184	0.39	1,265	0.0	\$185.32	\$752.00	\$150.00	3.25
Tax Office	16	Compact Fluorescent: 13W - 2L	Occupancy Sensor	13	2,184	Relamp	No	16	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.05	159	0.0	\$23.36	\$1,720.10	\$0.00	73.63
Tax Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,120	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,120	0.08	361	0.0	\$52.95	\$150.40	\$30.00	2.27
Tax Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	93	3,120	Relamp	No	2	LED - Linear Tubes: (3) 4' Lamps	Wall Switch	44	3,120	0.08	361	0.0	\$52.95	\$150.40	\$30.00	2.27
Tax Office Exterior	1	Compact Fluorescent: 9W - 2L	Wall Switch	9	4,380	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	6	4,380	0.00	14	0.0	\$2.03	\$107.51	\$0.00	53.03
Tax Office Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Human Resources Office	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.26	843	0.0	\$123.55	\$585.00	\$100.00	3.93
Human Resources Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Human Resources Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Mayor/Administrator	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.16	506	0.0	\$74.13	\$351.00	\$60.00	3.93
Mayor/Administrator	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Mayor/Administrator	7	Compact Fluorescent: 13W - 2L	Occupancy Sensor	13	2,184	Relamp	No	7	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	70	0.0	\$10.22	\$752.54	\$0.00	73.63
Mayor/Administrator Storage	1	Compact Fluorescent: 13W - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Mayor/Administrator Coffee Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.05	241	0.0	\$35.30	\$387.00	\$55.00	9.41
Mayor/Administrator Coffee Room	4	Compact Fluorescent: 13W - 2L	Wall Switch	13	3,120	Relamp	Yes	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	97	0.0	\$14.18	\$430.02	\$35.00	27.85
Mayor/Administrator Coffee Room	2	Halogen Incandescent Recessed domelight	Wall Switch	50	3,120	Relamp	Yes	2	LED Screw-In Lamps: Screw-in LED	Occupancy Sensor	8	2,184	0.07	327	0.0	\$47.87	\$107.51	\$45.00	1.31
Mayor/Administrator - Office 1	4	Metal Halide: (1) 175W Lamp	Wall Switch	215	3,120	Fixture Replacement	Yes	4	LED - Fixtures: Downlight Pendant	Occupancy Sensor	65	2,184	0.54	2,480	0.0	\$363.37	\$2,550.32	\$40.00	6.91
Mayor/Administrator - Office 2	4	Metal Halide: (1) 175W Lamp	Wall Switch	215	3,120	Fixture Replacement	Yes	4	LED - Fixtures: Downlight Pendant	Occupancy Sensor	65	2,184	0.54	2,480	0.0	\$363.37	\$2,550.32	\$40.00	6.91
Mayor/Administrator - Office 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Finance/Purchasing Dept	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.32	1,012	0.0	\$148.26	\$702.00	\$120.00	3.93
Finance/Purchasing Dept.	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Finance/Purchasing Dept - Office 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Finance/Purchasing Dept - Office 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Finance/Purchasing Dept - Office 3	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Finance/Purchasing Dept - Office 3 Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Finance/Purchasing Dept - Office 3 Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Employee Lounge	4	Metal Halide: (1) 175W Lamp	Wall Switch	215	3,120	Fixture Replacement	Yes	4	LED - Fixtures: Downlight Pendant	Occupancy Sensor	65	2,184	0.54	2,480	0.0	\$363.37	\$2,550.32	\$40.00	6.91
Computer Services	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Computer Services	5	Compact Fluorescent Flood Lights	Occupancy Sensor	15	2,184	Relamp	No	5	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	11	2,184	0.02	57	0.0	\$8.42	\$268.77	\$0.00	31.91
Computer Services	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Computer Services - Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Computer Services - Server Room	3	Compact Fluorescent Flood Lights	Occupancy Sensor	15	2,184	Relamp	No	3	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	11	2,184	0.01	34	0.0	\$5.05	\$161.26	\$0.00	31.91
Computer Services - Server Room	3	Incandescent Flood Lights	Occupancy Sensor	65	2,184	Relamp	No	3	LED Screw-In Lamps: Flood Light	Occupancy Sensor	10	2,184	0.13	424	0.0	\$62.05	\$234.76	\$15.00	3.54
Computer Services - Storage	1	Compact Fluorescent Can pin	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$53.75	\$0.00	25.77
Building Services	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Building Services - Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Building Services - Office	1	Compact Fluorescent Pin Can - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Building Services - Records Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.16	506	0.0	\$74.13	\$351.00	\$60.00	3.93
Mail Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	337	0.0	\$49.42	\$234.00	\$40.00	3.93
Stairwell 2	2	Compact Fluorescent Can screw-in - 1L	None	13	8,760	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	None	9	8,760	0.01	80	0.0	\$11.71	\$107.51	\$0.00	9.18
Stairwell 2	2	Compact Fluorescent Pin style	None	13	8,760	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	None	9	8,760	0.01	80	0.0	\$11.71	\$107.51	\$0.00	9.18
Building Dept.	5	Compact Fluorescent Pin Can - 1L	Occupancy Sensor	13	2,184	Relamp	No	5	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	50	0.0	\$7.30	\$268.77	\$0.00	36.81
Building Dept.	28	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	28	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.74	2,361	0.0	\$345.94	\$1,638.00	\$280.00	3.93
Building Dept.	2	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.09	1,107	0.0	\$162.18	\$215.11	\$0.00	1.33
Building Dept - Office Miller	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Building Dept - Office Miller	2	Compact Fluorescent Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$215.01	\$0.00	73.63
Building Dept - Office Miller	2	Linear Fluorescent - T12: 2' T12 (40W) - 1L	Wall Switch	46	3,120	Relamp & Reballast	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.06	262	0.0	\$38.35	\$466.00	\$45.00	10.98
Building Dept - Office Miller	3	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Wall Switch	25	3,120	Relamp & Reballast	Yes	3	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,184	0.05	209	0.0	\$30.57	\$280.50	\$50.00	7.54
Building Dept - Office Miller	1	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	50	3,120	Relamp & Reballast	Yes	1	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,184	0.03	139	0.0	\$20.38	\$107.00	\$45.00	3.04
Building Dept - Office Petriano	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Head Srg. Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Housing Dept. Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Zoning Dept. and Planning	3	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.13	1,660	0.0	\$243.27	\$322.67	\$0.00	1.33
Zoning Dept. and Planning	7	Compact Fluorescent Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	7	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	70	0.0	\$10.22	\$752.54	\$0.00	73.63
Zoning Dept. and Planning	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.24	759	0.0	\$111.19	\$526.50	\$90.00	3.93
Zoning Dept. and Planning - Conference Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Zoning Dept. and Planning Office Varga	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.13	609	0.0	\$89.21	\$350.00	\$60.00	3.25
Zoning Dept. and Planning Office Yuke	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Zoning Dept. and Planning Office Yuke	5	Compact Fluorescent Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	5	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	50	0.0	\$7.30	\$537.53	\$0.00	73.63
Zoning Dept. and Planning Office Yuke	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.16	506	0.0	\$74.13	\$351.00	\$60.00	3.93
County Clerk	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
County Clerk	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.37	1,181	0.0	\$172.97	\$819.00	\$140.00	3.93
County Clerk	2	Linear Fluorescent - T12: 4' T12 (40W) - 1L	Wall Switch	46	3,120	Relamp & Reballast	Yes	2	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.06	262	0.0	\$38.35	\$312.00	\$30.00	7.35
County Clerk - Storage	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
County Clerk - Office	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Court Room	4	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.17	2,214	0.0	\$324.36	\$430.22	\$0.00	1.33
Court Room	16	Metal Halide: (1) 175W Lamp	Wall Switch	215	3,120	Fixture Replacement	Yes	16	LED - Fixtures: Downlight Pendant	Occupancy Sensor	65	2,184	2.16	9,920	0.0	\$1,453.48	\$10,817.28	\$220.00	7.29
Court Room	33	Compact Fluorescent Pin Can - 2L	Wall Switch	13	3,120	Relamp	Yes	33	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.17	799	0.0	\$117.02	\$3,547.70	\$35.00	30.02
Court Room	4	Linear Fluorescent - T8: 3' T8 (25W) - 1L	Wall Switch	27	3,120	Relamp	Yes	4	LED - Linear Tubes: (1) 3' Lamp	Occupancy Sensor	11	2,184	0.06	287	0.0	\$42.04	\$139.20	\$35.00	2.48
Stairwell 3	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.08	1,015	0.0	\$148.67	\$175.50	\$30.00	0.98
Judge's Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.03	152	0.0	\$22.30	\$174.50	\$30.00	6.48
Judge's Office	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.03	152	0.0	\$22.30	\$58.50	\$30.00	1.28
Conference Room	6	Halogen Incandescent: 50W - 1L	Wall Switch	50	3,120	Relamp	Yes	6	LED Screw-In Lamps: Screw-in LED	Occupancy Sensor	8	2,184	0.21	980	0.0	\$143.60	\$592.52	\$65.00	3.67
Conference Rpm	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.07	319	0.0	\$46.75	\$143.60	\$55.00	1.90
Conference Room - above sink	1	Linear Fluorescent - T12: 2' T12 (20W) - 1L	Wall Switch	25	3,120	Relamp & Reballast	Yes	1	LED - Linear Tubes: (1) 2' Lamp	Occupancy Sensor	9	2,184	0.02	70	0.0	\$10.19	\$93.50	\$40.00	5.25
Conference Room G	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.14	638	0.0	\$93.49	\$403.20	\$60.00	3.67
Conference Room E	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Conference Room E	2	Incandescent: Flood Lights	Occupancy Sensor	65	2,184	Relamp	No	2	LED Screw-In Lamps: Flood Light	Occupancy Sensor	10	2,184	0.09	282	0.0	\$41.37	\$156.51	\$10.00	3.54
Electric Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Conference Room F	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.08	253	0.0	\$37.06	\$175.50	\$30.00	3.93
Conference Room F	3	Incandescent: Flood Lights	Occupancy Sensor	65	2,184	Relamp	No	3	LED Screw-In Lamps: Flood Light	Occupancy Sensor	10	2,184	0.13	424	0.0	\$62.05	\$234.76	\$15.00	3.54

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Utility Room	1	Compact Fluorescent Pin Can - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Women's Restroom	4	Compact Fluorescent Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	40	0.0	\$5.84	\$430.02	\$0.00	73.63
Women's Restroom	1	Compact Fluorescent Pin Can - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Women's Restroom	2	Compact Fluorescent Pin Wall Mount - 2L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$107.51	\$0.00	36.81
Women's Restroom	1	Compact Fluorescent Pin Ceiling Mount	Occupancy Sensor	13	2,184	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.00	10	0.0	\$1.46	\$53.75	\$0.00	36.81
Men's Restroom	4	Compact Fluorescent Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	40	0.0	\$5.84	\$430.02	\$0.00	73.63
Men's Restroom	1	Compact Fluorescent Pin Can - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Men's Restroom	2	Compact Fluorescent Pin Wall Mount - 2L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$107.51	\$0.00	36.81
Men's Restroom	1	Compact Fluorescent Pin Ceiling Mount	Occupancy Sensor	13	2,184	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.00	10	0.0	\$1.46	\$53.75	\$0.00	36.81
A-B Room	14	Compact Fluorescent: Globe Light	Wall Switch	32	3,120	Relamp	Yes	14	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	22	2,184	0.18	834	0.0	\$122.20	\$1,022.54	\$35.00	8.08
A-B Room	4	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	4	LED Exit Signs: 2 W Lamp	None	6	8,760	0.17	2,214	0.0	\$324.36	\$430.22	\$0.00	1.33
A-B Room	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.58	1,855	0.0	\$271.81	\$1,287.00	\$220.00	3.93
A-B Room	4	Compact Fluorescent: Flood Lights - 1L	Wall Switch	65	3,120	Relamp	Yes	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	46	2,184	0.11	484	0.0	\$70.92	\$215.01	\$35.00	2.54
A-B Room - Storage	2	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Wall Switch	88	3,120	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	494	0.0	\$72.42	\$350.00	\$20.00	4.56
A-B Room - Electric Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.08	361	0.0	\$52.95	\$175.50	\$30.00	2.75
D Room	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.33	1,522	0.0	\$223.03	\$701.00	\$120.00	2.61
D Room - Storage	2	Linear Fluorescent - T12: 2' T12 (20W) - 2L	Wall Switch	50	3,120	Relamp & Reballast	Yes	2	LED - Linear Tubes: (2) 2' Lamps	Occupancy Sensor	17	2,184	0.06	278	0.0	\$40.75	\$330.00	\$20.00	7.61
Kitchen	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.03	84	0.0	\$12.35	\$58.50	\$10.00	3.93
Kitchen	1	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Occupancy Sensor	93	2,184	Relamp	No	1	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,184	0.04	126	0.0	\$18.53	\$75.20	\$15.00	3.25
Food Pantry	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.08	253	0.0	\$37.06	\$175.50	\$30.00	3.93
Food Pantry - Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.16	506	0.0	\$74.13	\$351.00	\$60.00	3.93
Food Pantry - Office	1	Compact Fluorescent Recessed Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.00	10	0.0	\$1.46	\$107.51	\$0.00	73.63
Food Pantry - Office	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.13	422	0.0	\$61.77	\$292.50	\$50.00	3.93
Food Pantry - Office	1	Compact Fluorescent Recessed Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.00	10	0.0	\$1.46	\$107.51	\$0.00	73.63
Women's Restroom	4	Compact Fluorescent Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	40	0.0	\$5.84	\$430.02	\$0.00	73.63

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Women's Restroom	2	Compact Fluorescent: Pin Wall Mount - 2L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$107.51	\$0.00	36.81
Women's Restroom	1	Compact Fluorescent: Pin Ceiling Mount	Occupancy Sensor	13	2,184	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.00	10	0.0	\$1.46	\$53.75	\$0.00	36.81
Wash Room	1	Compact Fluorescent: Recessed Can - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Men's Restroom	3	Compact Fluorescent: Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	3	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	30	0.0	\$4.38	\$322.52	\$0.00	73.63
Men's Restroom	2	Compact Fluorescent: Pin Ceiling Mount - 2L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$215.01	\$0.00	73.63
Men's Restroom	2	Compact Fluorescent: Pin Wall Mount - 1L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$107.51	\$0.00	36.81
Chiefs Office	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.16	506	0.0	\$74.13	\$351.00	\$60.00	3.93
Evidence Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.11	482	0.0	\$70.60	\$234.00	\$40.00	2.75
Evidence Room	4	U-Bend Fluorescent - T8: U T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	4	LED - Linear Tubes: (2) U-Lamp	Wall Switch	33	3,120	0.09	423	0.0	\$62.04	\$252.80	\$0.00	4.07
Police Chapel	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	8,760	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	8,760	0.16	2,029	0.0	\$297.33	\$351.00	\$60.00	0.98
Side Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.05	241	0.0	\$35.30	\$117.00	\$20.00	2.75
Armory Entry	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.05	241	0.0	\$35.30	\$117.00	\$20.00	2.75
Armory	2	Linear Fluorescent - T8: 2' T8 (17W) - 2L	Wall Switch	33	3,120	Relamp	No	2	LED - Linear Tubes: (2) 2' Lamps	Wall Switch	17	3,120	0.03	117	0.0	\$17.11	\$96.40	\$20.00	4.46
Admin Office	4	Compact Fluorescent: Recessed Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	40	0.0	\$5.84	\$430.02	\$0.00	73.63
Admin Office	2	Compact Fluorescent: Recessed Can - 2L	Wall Switch	13	3,120	Relamp	Yes	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	48	0.0	\$7.09	\$331.01	\$20.00	43.85
Admin Office - Restroom	2	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	2	LED Exit Signs: 2 W Lamp	None	6	8,760	0.09	1,107	0.0	\$162.18	\$215.11	\$0.00	1.33
Admin Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.21	675	0.0	\$98.84	\$468.00	\$80.00	3.93
Admin Office	1	Linear Fluorescent - T12: 4' T12 (40W) - 2L	Occupancy Sensor	88	2,184	Relamp & Reballast	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	151	0.0	\$22.09	\$117.00	\$10.00	4.84
Admin Office - Kitchen Area	1	Compact Fluorescent: Recessed Can - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Admin Office - Conference Room	6	Compact Fluorescent: Recessed Can - 2L	Wall Switch	13	3,120	Relamp	Yes	6	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.03	145	0.0	\$21.28	\$915.04	\$35.00	41.36
Admin Office - Conference Room	3	Incandescent Flood Lights - 1L	Wall Switch	65	3,120	Relamp	Yes	3	LED Screw-In Lamps: Flood Light	Occupancy Sensor	10	2,184	0.14	637	0.0	\$93.34	\$234.76	\$50.00	1.98
Admin Office - Storage Room	1	Compact Fluorescent: Long Lamp Pin - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Admin Office - Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	337	0.0	\$49.42	\$234.00	\$40.00	3.93
Storage Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.05	241	0.0	\$35.30	\$117.00	\$20.00	2.75
Report Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.08	253	0.0	\$37.06	\$175.50	\$30.00	3.93

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Crime Lab	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	337	0.0	\$49.42	\$234.00	\$40.00	3.93
Sgt. Office	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.21	675	0.0	\$98.84	\$468.00	\$80.00	3.93
Ready Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.21	675	0.0	\$98.84	\$468.00	\$80.00	3.93
Men's Restroom	4	Compact Fluorescent: Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	40	0.0	\$5.84	\$430.02	\$0.00	73.63
Men's Restroom	3	Compact Fluorescent: Pin Wall Mount - 1L	Occupancy Sensor	13	2,184	Relamp	No	3	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	30	0.0	\$4.38	\$161.26	\$0.00	36.81
Men's Restroom	1	Compact Fluorescent: Pin Ceiling Mount - 2L	Occupancy Sensor	13	2,184	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.00	10	0.0	\$1.46	\$107.51	\$0.00	73.63
Men's Locker	3	Compact Fluorescent: Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	3	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	30	0.0	\$4.38	\$322.52	\$0.00	73.63
Men's Locker	7	Compact Fluorescent: Long Lamp Pin - 2L	Occupancy Sensor	13	2,184	Relamp	No	7	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	70	0.0	\$10.22	\$752.54	\$0.00	73.63
Men's Locker	3	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	3	LED Exit Signs: 2 W Lamp	None	6	8,760	0.13	1,660	0.0	\$243.27	\$322.67	\$0.00	1.33
Men's Locker	1	Incandescent: 60W - 1L	Wall Switch	60	3,120	Relamp	No	1	LED Screw-In Lamps: Screw-in LED	Wall Switch	9	3,120	0.04	186	0.0	\$27.28	\$53.75	\$5.00	1.79
Weight Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.16	506	0.0	\$74.13	\$351.00	\$60.00	3.93
Weight Room	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Women's Restroom	8	Compact Fluorescent: Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	8	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	80	0.0	\$11.68	\$860.05	\$0.00	73.63
Women's Restroom	2	Compact Fluorescent: Pin Wall Mount - 1L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$107.51	\$0.00	36.81
Women's Restroom	2	Compact Fluorescent: Pin Ceiling Mount - 2L	Occupancy Sensor	13	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	20	0.0	\$2.92	\$215.01	\$0.00	73.63
Women's Restroom	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Women's Locker	2	Compact Fluorescent: Long Lamp Pin - 2L	Wall Switch	13	3,120	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.01	28	0.0	\$4.17	\$215.01	\$0.00	51.54
Women's Locker	1	Compact Fluorescent: Long Lamp Pin - 2L	Wall Switch	13	8,760	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	8,760	0.00	40	0.0	\$5.86	\$107.51	\$0.00	18.36
Women's Locker	1	Exit Signs: Incandescent	None	60	8,760	Fixture Replacement	No	1	LED Exit Signs: 2 W Lamp	None	6	8,760	0.04	553	0.0	\$81.09	\$107.56	\$0.00	1.33
Patrol Lt. Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	337	0.0	\$49.42	\$234.00	\$40.00	3.93
Admin Lt. Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.11	337	0.0	\$49.42	\$234.00	\$40.00	3.93
EMS Office	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.13	609	0.0	\$89.21	\$350.00	\$60.00	3.25
Records/Admin	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.18	590	0.0	\$86.48	\$409.50	\$70.00	3.93
Records/Admin - Storage Closet	1	Linear Fluorescent - T5: 2' T5 (14W) - 1L	Wall Switch	18	3,120	Relamp	No	1	LED - Linear Tubes: (1) 2' Lamp	Wall Switch	9	3,120	0.01	35	0.0	\$5.08	\$31.90	\$5.00	5.29
Computer Services	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.05	241	0.0	\$35.30	\$117.00	\$20.00	2.75

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Server Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
PBA Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Communications	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.13	609	0.0	\$89.21	\$234.00	\$75.00	1.78
Communications	10	Incandescent Flood Lights - 1L	Wall Switch	65	3,120	Relamp	Yes	10	LED Screw-In Lamps: Flood Light	Occupancy Sensor	10	2,184	0.46	2,124	0.0	\$311.14	\$1,052.53	\$85.00	3.11
Communications - Restroom	1	Compact Fluorescent: Pin Can - 2L	Wall Switch	13	3,120	Relamp	No	1	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	3,120	0.00	14	0.0	\$2.09	\$107.51	\$0.00	51.54
Communications - Server Room	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.03	120	0.0	\$17.65	\$58.50	\$10.00	2.75
Break Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.20	913	0.0	\$133.82	\$621.00	\$95.00	3.93
Detection Bureau	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.26	843	0.0	\$123.55	\$585.00	\$100.00	3.93
Detection Bureau	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Detection Bureau	4	Compact Fluorescent: Pin Can - 2L	Occupancy Sensor	17	2,184	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	12	2,184	0.02	52	0.0	\$7.64	\$430.02	\$0.00	56.30
Detection Bureau - Coffee Room	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.08	253	0.0	\$37.06	\$175.50	\$30.00	3.93
Detection Bureau - Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.08	253	0.0	\$37.06	\$175.50	\$30.00	3.93
Detection Bureau - Office	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.08	253	0.0	\$37.06	\$175.50	\$30.00	3.93
Detection Bureau - Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Intervention Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.05	169	0.0	\$24.71	\$117.00	\$20.00	3.93
Visitor Room/Storage	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	8,760	0.05	676	0.0	\$99.11	\$117.00	\$20.00	0.98
Sully Port	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	6,132	0.40	5,129	0.0	\$751.43	\$972.00	\$155.00	1.09
Sully Port	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Sully Port - Storage	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.08	253	0.0	\$37.06	\$175.50	\$30.00	3.93
Women's Cells (2)	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.05	676	0.0	\$99.11	\$117.00	\$20.00	0.98
Women's Cells Entry	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.05	676	0.0	\$99.11	\$117.00	\$20.00	0.98
Processing Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.11	482	0.0	\$70.60	\$234.00	\$40.00	2.75
Cell Corridor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.16	723	0.0	\$105.90	\$351.00	\$60.00	2.75
Cell Corridor	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Men's Cells (4)	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.11	1,353	0.0	\$198.22	\$234.00	\$40.00	0.98

Location	Existing Conditions					Proposed Conditions								Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years	
Men's Cells (4)	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	None	62	8,760	Relamp	No	3	LED - Linear Tubes: (2) 4' Lamps	None	29	8,760	0.08	1,015	0.0	\$148.67	\$175.50	\$30.00	0.98	
Interview Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	8,760	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	8,760	0.05	676	0.0	\$99.11	\$117.00	\$20.00	0.98	
Police Dept. Corridor	40	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	40	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,184	1.33	6,089	0.0	\$892.11	\$3,340.00	\$400.00	3.30	
Police Dept. Corridor	12	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	12	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Police Dept. Corridor	5	Compact Fluorescent: Pin Can - 2L	Wall Switch	12	3,120	Relamp	Yes	5	LED Screw-In Lamps: CFL Retrofit to LED	High/Low Control	8	2,184	0.02	112	0.0	\$16.37	\$537.53	\$0.00	32.84	
Entry Foyer	2	Compact Fluorescent: Pin Can - 1L	Occupancy Sensor	5	2,184	Relamp	No	2	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	4	2,184	0.00	8	0.0	\$1.12	\$107.51	\$0.00	95.72	
Corridor	1	U-Bend Fluorescent - T8: U T8 (32W) - 1L	Wall Switch	39	3,120	Relamp	No	1	LED - Linear Tubes: (1) U-Lamp	Wall Switch	17	3,120	0.02	82	0.0	\$12.03	\$39.73	\$0.00	3.30	
Corridor	3	Incandescent Flood Lights - 1L	Wall Switch	65	3,120	Relamp	Yes	3	LED Screw-In Lamps: Flood Light	High/Low Control	10	2,184	0.14	637	0.0	\$93.34	\$434.76	\$15.00	4.50	
LL Entry Interior	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	62	2,184	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.03	84	0.0	\$12.35	\$58.50	\$10.00	3.93	
Corridors	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Lobby	12	Metal Halide: (1) 175W Lamp	Wall Switch	215	3,120	Fixture Replacement	No	12	LED - Fixtures: Downlight Pendant	Wall Switch	65	3,120	1.44	6,593	0.0	\$965.92	\$7,302.96	\$60.00	7.50	
Lobby	30	Compact Fluorescent: Pin Can - 2L	Occupancy Sensor	13	2,184	Relamp	No	30	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.09	299	0.0	\$43.80	\$3,225.18	\$0.00	73.63	
Lobby	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	10	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.26	1,205	0.0	\$176.50	\$585.00	\$100.00	2.75	
ABCD Rooms	4	Compact Fluorescent: Pin Can - 1L	Occupancy Sensor	13	2,184	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.01	40	0.0	\$5.84	\$215.01	\$0.00	36.81	
ABCD Rooms	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.17	761	0.0	\$111.51	\$408.50	\$70.00	3.04	
ABCD Rooms	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Clerk Side	8	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	8	LED - Linear Tubes: (1) 4' Lamp	Occupancy Sensor	15	2,184	0.14	638	0.0	\$93.49	\$1,097.20	\$145.00	10.19	
Clerk Side	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.36	1,674	0.0	\$245.33	\$643.50	\$145.00	2.03	
Clerk Side	3	Linear Fluorescent - T8: 3' T8 (25W) - 2L	Wall Switch	48	3,120	Relamp	Yes	3	LED - Linear Tubes: (2) 3' Lamps	Occupancy Sensor	21	2,184	0.08	365	0.0	\$53.43	\$175.50	\$35.00	2.63	
Clerk Side	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	
Clerk Side	4	Compact Fluorescent: Screw-in	Wall Switch	15	3,120	Relamp	Yes	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	11	2,184	0.02	112	0.0	\$16.37	\$215.01	\$35.00	11.00	
Clerk Side	4	Compact Fluorescent: Pin Can - 2L	Wall Switch	13	3,120	Relamp	Yes	4	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	2,184	0.02	97	0.0	\$14.18	\$430.02	\$35.00	27.85	
Back Corridor	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,184	0.07	319	0.0	\$46.75	\$343.60	\$20.00	6.92	
Back Corridor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.05	241	0.0	\$35.30	\$117.00	\$20.00	2.75	
Back Corridor	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00	

Location	Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Court Side	9	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	9	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,184	0.30	1,370	0.0	\$200.73	\$796.50	\$125.00	3.35
Corridor	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	High/Low Control	29	2,184	0.20	913	0.0	\$133.82	\$551.00	\$60.00	3.67
Corridor	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Corridor	4	Compact Fluorescent: Pin style - 2L	Wall Switch	15	3,120	Relamp	Yes	4	LED Screw-In Lamps: CFL Retrofit to LED	High/Low Control	11	2,184	0.02	112	0.0	\$16.37	\$430.02	\$0.00	26.28
Corridor	3	Linear Fluorescent - T8: 3' T8 (25W) - 2L	Wall Switch	48	3,120	Relamp	Yes	3	LED - Linear Tubes: (3) 2' Lamps	High/Low Control	26	2,184	0.07	330	0.0	\$48.38	\$175.50	\$0.00	3.63
Center Corridor	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Center Corridor	4	Linear Fluorescent - T8: 4' T8 (32W) - 1L	Wall Switch	32	3,120	Relamp	Yes	4	LED - Linear Tubes: (1) 4' Lamp	High/Low Control	15	2,184	0.07	319	0.0	\$46.75	\$343.60	\$20.00	6.92
Center Corridor	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	62	3,120	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	3,120	0.05	241	0.0	\$35.30	\$117.00	\$20.00	2.75
Exterior	4	Compact Fluorescent: 13W - 1L	Wall Switch	13	4,380	Relamp	No	4	LED Screw-In Lamps: CFL Retrofit to LED	Wall Switch	9	4,380	0.01	80	0.0	\$11.71	\$215.01	\$0.00	18.36
Exterior	6	LED - Fixtures: Bollard Fixture	Occupancy Sensor	20	4,380	None	No	6	LED - Fixtures: Bollard Fixture	Occupancy Sensor	20	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Parking Lot	59	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Occupancy Sensor	150	4,380	None	No	59	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Occupancy Sensor	150	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Door Light	2	Metal Halide: (1) 175W Lamp	Occupancy Sensor	215	4,380	Fixture Replacement	No	2	LED - Fixtures: Downlight Pendant	Occupancy Sensor	65	4,380	0.24	1,543	0.0	\$226.00	\$1,217.16	\$10.00	5.34
Car Cover	5	Incandescent: Screw-in 60W - 1L	Occupancy Sensor	60	4,380	Relamp	No	5	LED Screw-In Lamps: Screw-in LED	Occupancy Sensor	9	4,380	0.20	1,307	0.0	\$191.46	\$268.77	\$25.00	1.27
Sign Light	4	LED - Fixtures: Outdoor Post-Mount	Occupancy Sensor	50	4,380	None	No	4	LED - Fixtures: Outdoor Post-Mount	Occupancy Sensor	50	4,380	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Entry Foyer	3	Compact Fluorescent: Flood screw-in	Occupancy Sensor	13	4,380	Relamp	No	3	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	9	4,380	0.01	60	0.0	\$8.78	\$161.26	\$0.00	18.36
Main Entry	5	Compact Fluorescent: Pin style - 1L	Occupancy Sensor	9	4,380	Relamp	No	5	LED Screw-In Lamps: CFL Retrofit to LED	Occupancy Sensor	6	4,380	0.01	69	0.0	\$10.14	\$268.77	\$0.00	26.52

Motor Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis						
		Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Whole Building	2	Heating Hot Water Pump	1.0	78.5%	No	2,745	Yes	85.5%	No		0.09	320	0.0	\$46.94	\$948.12	\$0.00	20.20
Boiler Room	Whole Building - DHW	1	Water Supply Pump	0.1	70.0%	No	8,760	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Building Services, Computer Office, Housing Dept., Finance Dept., Break Room	1	Exhaust Fan	0.3	70.0%	No	8,760	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Court Office/Tax Dept., HR, Mayor/Admin Office	1	Exhaust Fan	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Dispatch, IT Room, Men's/Women's Restrooms, Lt. Break Room	1	Exhaust Fan	0.8	75.0%	No	8,760	No	75.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lobby Restroom, Food Pantry, Kitchen, D Room	1	Exhaust Fan	0.8	75.0%	No	2,745	No	75.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	A-B Room	1	Exhaust Fan	0.8	75.0%	No	2,745	No	75.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lobby/Foyer, Detective Bureau, Jail Cells	1	Exhaust Fan	0.3	70.0%	No	8,760	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Sally Port	1	Exhaust Fan	0.3	70.0%	No	8,760	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Storage Rec. Center	1	Exhaust Fan	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Boiler Room	Non-condensing boiler	1	Combustion Air Fan	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Sally Port	Sally Port	1	Other	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Storage Rec. Center	Storage Rec. Center	1	Other	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
LL entry interior	LL entry interior	1	Other	0.3	70.0%	No	2,745	No	70.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Building Services, Computer Office, Housing Dept., Finance Dept., Break Room	1	Supply Fan	7.5	91.0%	No	3,391	No	91.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Court Office/Tax Dept., HR, Mayor/Admin Office	1	Supply Fan	5.0	89.5%	No	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Dispatch, IT Room, Men's/Women's Restrooms, Lt. Break Room	1	Supply Fan	5.0	89.5%	No	8,760	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lobby Restroom, Food Pantry, Kitchen, D Room	1	Supply Fan	5.0	89.5%	No	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	A-B Room	1	Supply Fan	7.5	88.5%	No	3,391	Yes	91.0%	No		0.10	442	0.0	\$64.72	\$1,131.44	\$0.00	17.48
Roof	Lobby/Foyer, Detective Bureau, Jail Cells	1	Supply Fan	5.0	89.5%	No	8,760	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

		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?	Annual Operating Hours	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Ready Room, Lt. Office, Records, Storage, Evidence, Chiefs Office	1	Supply Fan	5.0	89.5%	No	8,760	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Ready Room, Lt. Office, Records, Storage, Evidence, Chiefs Office	1	Exhaust Fan	0.8	75.0%	No	8,760	No	75.0%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Court Room (24/7)	1	Supply Fan	5.0	89.5%	No	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Clerk's Office, Planning/Zoning, Building Dept.	1	Supply Fan	7.5	88.5%	No	3,391	Yes	91.0%	No		0.10	442	0.0	\$64.72	\$1,131.44	\$0.00	17.48
Roof	Lobby	1	Supply Fan	5.0	89.5%	No	2,745	No	89.5%	No		0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Electric HVAC Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions		Proposed Conditions									Energy Impact & Financial Analysis							
		System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (kBtu/hr)	Cooling Mode Efficiency (SEER/EER)	Heating Mode Efficiency (COP)	Install Dual Enthalpy Economizer?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Roof	Ready Room, Lt. Office, Records, Storage, Evidence, Chief's Office	1	Packaged AC	15.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lobby/Foyer, Detective Bureau, Jail Cells	1	Packaged AC	12.50		Yes	1	Packaged AC	12.50		11.50		No	1.84	3,570	0.0	\$523.03	\$17,423.13	\$987.50	31.42
Roof	Building Services, Computer Office, Housing Dept., Finance Dept., Break Room	1	Packaged AC	20.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Clerk's Office, Planning/Zoning, Building Dept.	1	Packaged AC	20.00		Yes	1	Packaged AC	20.00		10.50		No	0.77	1,086	0.0	\$159.07	\$33,747.98	\$1,580.00	202.22
Roof	Lobby	1	Packaged AC	4.00		Yes	1	Packaged AC	4.00		14.00		No	0.86	1,213	0.0	\$177.79	\$9,075.84	\$368.00	48.98
Roof	Dispatch, IT Room, Men's/Women's Restrooms, Lt. Break Room	1	Packaged AC	12.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Court Office/Tax Dept., HR, Mayor/Admin Office	1	Packaged AC	21.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Court Room (24/7)	1	Packaged AC	4.00		Yes	1	Packaged AC	4.00		14.00		No	0.86	1,661	0.0	\$243.29	\$9,075.84	\$368.00	35.79
Roof	Lobby Restroom, Food Pantry, Kitchen, D Room	1	Packaged AC	12.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	A-B Room	1	Packaged AC	20.00		Yes	1	Packaged AC	20.00		10.50		No	0.77	1,086	0.0	\$159.07	\$33,747.98	\$1,580.00	202.22
Computer Room	Computer Room	1	Split-System AC	1.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Police Computer Room	Police Computer Room	1	Split-System AC	1.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Computer Room	Computer Room	1	Split-System AC	2.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Level Outdoor Entry	Police Radio Room	1	Split-System AC	1.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Police Radio Room	Police Radio Room	1	Split-System AC	1.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Police Dispatch	Police Dispatch	1	Split-System AC	3.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Level Outdoor Entry	Police Dispatch	1	Split-System AC	3.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Municipal Building	Computer Room	1	Split-System AC	1.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Municipal Building - Police	Police Computer Room	1	Split-System AC	2.00		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Main Level Outdoor Entry	IT Room	1	Split-System AC	2.50		No							No	0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00

Fuel Heating Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions		Proposed Conditions							Energy Impact & Financial Analysis						
		System Quantity	System Type	Output Capacity per Unit (MBh)	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Whole Building - Heat	1	Non-Condensing Hot Water Boiler	474.00	Yes	1	Condensing Hot Water Boiler	474.00	91.00%	Et	0.00	0	50.6	\$447.60	\$11,377.62	\$1,042.80	23.09
Roof	Ready Room, Lt. Office, Records, Storage, Evidence, Chiefs Office	1	Furnace	240.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Lobby/Foyer, Detective Bureau, Jail Cells	1	Furnace	240.00	Yes	1	Furnace	240.00	95.00%	AFUE	0.00	0	30.3	\$267.97	\$5,437.76	\$400.00	18.80
Roof	Building Services, Computer Office, Housing Dept., Finance Dept., Break Room	1	Furnace	288.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Clerk's Office, Planning/Zoning, Building Dept.	1	Furnace	322.00	Yes	1	Furnace	322.00	95.00%	AFUE	0.00	0	19.5	\$172.69	\$7,295.66	\$400.00	39.93
Roof	Lobby	1	Furnace	284.00	Yes	1	Furnace	284.00	95.00%	AFUE	0.00	0	16.3	\$144.41	\$6,434.68	\$400.00	41.79
Roof	Dispatch, IT Room, Men's/Women's Restrooms, Lt. Break Room	1	Furnace	240.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Court Office/Tax Dept., HR, Mayor/Admin Office	1	Furnace	384.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	Court Room (24/7)	1	Furnace	284.00	Yes	1	Furnace	284.00	95.00%	AFUE	0.00	0	16.3	\$144.41	\$6,434.68	\$400.00	41.79
Roof	Lobby Restroom, Food Pantry, Kitchen, D Room	1	Furnace	192.00	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00
Roof	A-B Room	1	Furnace	322.00	Yes	1	Furnace	322.00	95.00%	AFUE	0.00	0	19.5	\$172.69	\$7,295.66	\$400.00	39.93

DHW Inventory & Recommendations

Location	Area(s)/System(s) Served	Existing Conditions		Proposed Conditions						Energy Impact & Financial Analysis						
		System Quantity	System Type	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	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Boiler Room	Whole Building - DHW	1	Storage Tank Water Heater (> 50 Gal)	No						0.00	0	0.0	\$0.00	\$0.00	\$0.00	0.00


Plug Load Inventory

Existing Conditions				
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?
Municipal	46	Desktop	120.0	No
Municipal	17	Desk Printer	13.0	No
Municipal	7	Photocopier	240.0	Yes
Municipal	3	Microwave	800.0	No
Municipal	6	Coffee Maker	900.0	No
Municipal	3	Mini Fridge	27.6	No
Municipal	2	Shredder	146.0	No
Municipal	2	TV Tube	73.0	No
Municipal	2	Refrigerator	600.0	No
Municipal	1	Dishwasher	1,500.0	
Municipal	3	Laptop	29.0	No
Police	41	Desktop	120.0	Yes
Police	12	Desk Printer	80.0	Yes
Police	2	Microwave	800.0	No
Police	2	Mini Fridge	27.6	No
Police	1	Coffee Maker	900.0	No
Police	4	Photocopier	240.0	Yes
Police	5	TV LED	100.0	Yes
Police	1	Shredder	146.0	No
Police	2	Refrigerator	600.0	No
Police	1	Toaster	850.0	No
Mail Room	1	Envelope Cutter/Stuffer	360.0	No

Vending Machine Inventory & Recommendations

Location	Existing Conditions		Proposed Conditions	Energy Impact & Financial Analysis						
	Quantity	Vending Machine Type	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Total Installation Cost	Total Incentives	Simple Payback w/ Incentives in Years
Break Room	1	Non-Refrigerated	Yes	0.00	343	0.0	\$50.18	\$230.00	\$0.00	4.58
LL Area	2	Refrigerated	Yes	0.00	3,224	0.0	\$472.32	\$460.00	\$0.00	0.97
Employee Lounge	1	Refrigerated	Yes	0.00	1,612	0.0	\$236.16	\$230.00	\$0.00	0.97

Appendix B: ENERGY STAR® Statement of Energy Performance



ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

N/A **Municipal Building (Includes Police Department)**

Primary Property Type: Other - Public Services
 Gross Floor Area (ft²): 48,268
 Built: 1993

For Year Ending: January 31, 2017
 Date Generated: March 28, 2018

ENERGY STAR® Score¹

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 Municipal Building (Includes Police Department) 641 Plainsboro Road Plainsboro, New Jersey 08536	Property Owner Township of Plainsboro 641 Plainsboro Road Plainsboro, NJ 08536 () -	Primary Contact Neil Blitz 641 Plainsboro Road Plainsboro, NJ 08536 609-799-0099 nblitz@plainsboronj.com
Property ID: 6258276		

Energy Consumption and Energy Use Intensity (EUI)			
Site EUI 104.7 kBtu/ft ²	Annual Energy by Fuel Electric - Grid (kBtu) 2,532,210 (50%) Natural Gas (kBtu) 2,521,437 (50%)	National Median Comparison National Median Site EUI (kBtu/ft ²) 58.7 National Median Source EUI (kBtu/ft ²) 123.1 % Diff from National Median Source EUI 78%	
Source EUI 219.6 kBtu/ft ²		Annual Emissions Greenhouse Gas Emissions (Metric Tons CO ₂ e/year) 415	

Signature & Stamp of Verifying Professional

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

Signature: _____ Date: _____

Licensed Professional

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() -



Professional Engineer Stamp (if applicable)