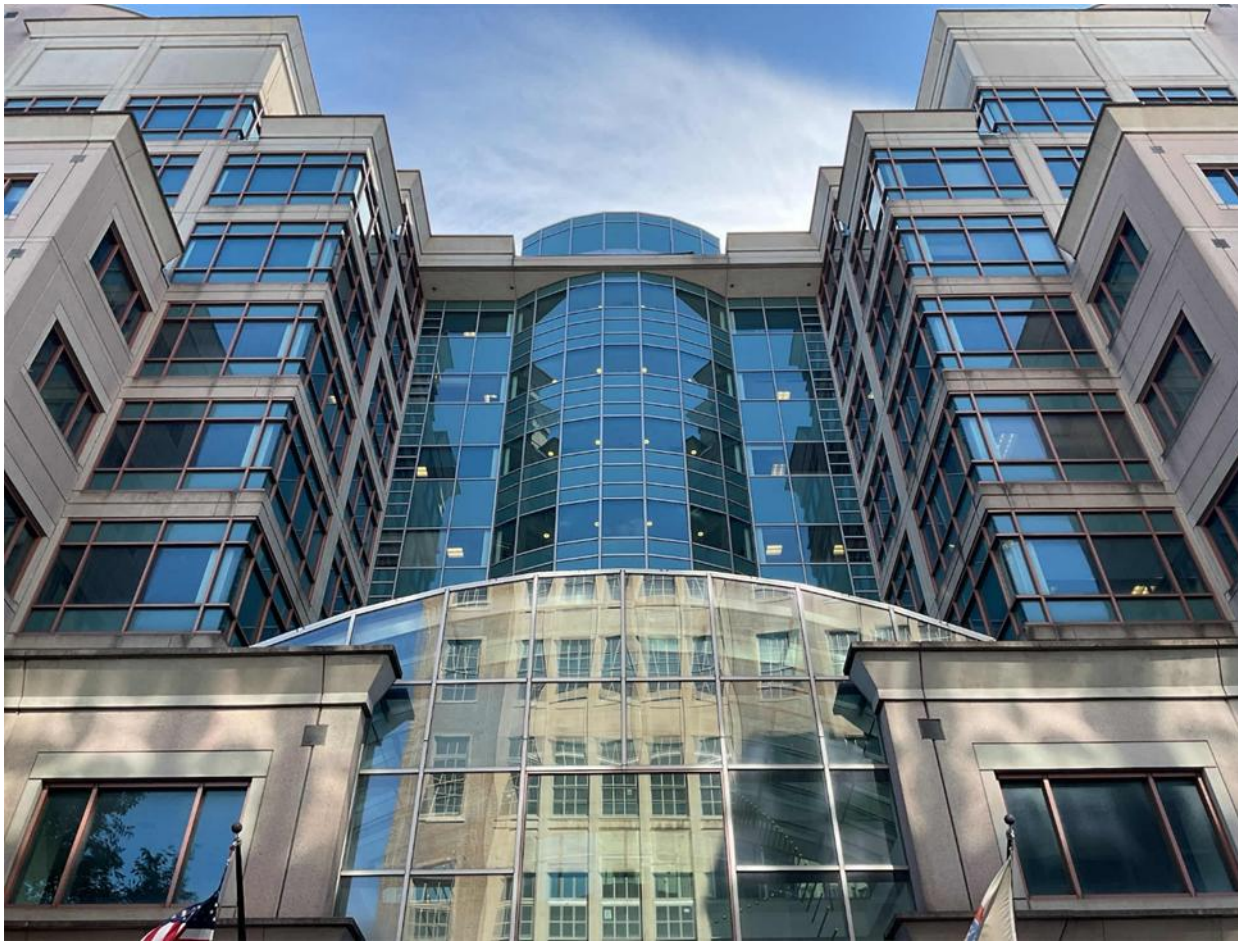

Local Government Energy Audit Report

225 E. State Street and Garage

January 22, 2025

Prepared for:

State of New Jersey
225 E State Street
Trenton, New Jersey 08608

Prepared by:

TRC
317 George Street
New Brunswick, New Jersey 08901

Disclaimer

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

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

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

Incentive values provided in this report are estimated based on previously run state efficiency programs. Incentive levels are not guaranteed. The NJBPU reserves the right to extend, modify, or terminate programs without prior notice. Please review all available utility program incentives and eligibility requirements prior to selecting and installing any energy conservation measures.

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

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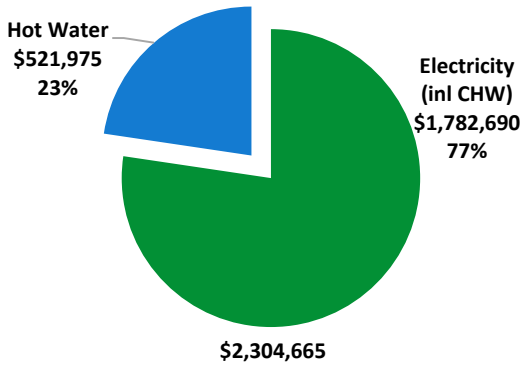
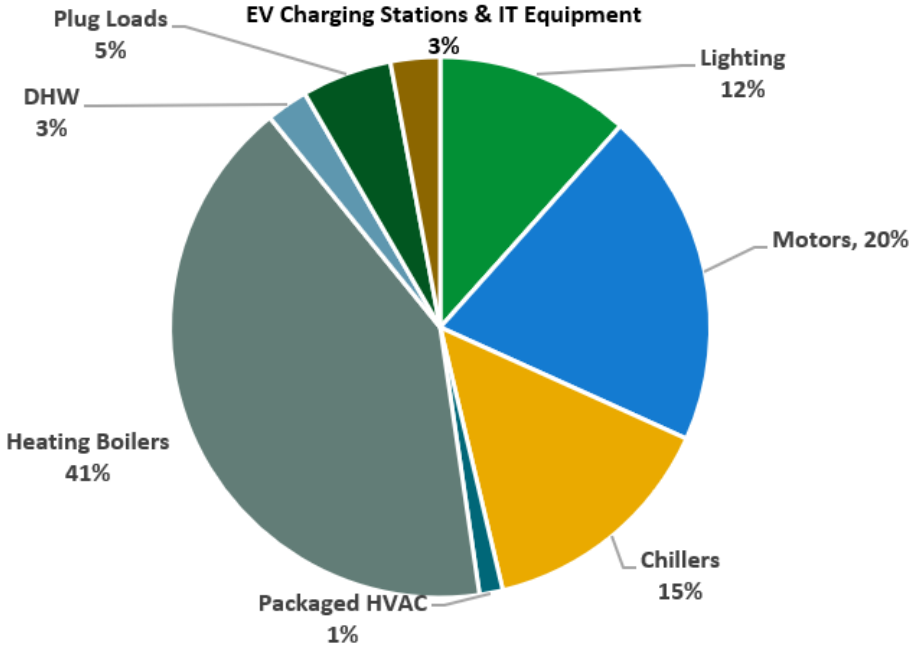
Table of Contents

1 EXECUTIVE SUMMARY

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for 225 E State Street and Trenton Office Complex Parking Garage. This report provides you with information about your facility's energy use, identifies energy conservation measures (ECMs) that can reduce your energy use, provides information and assistance to help make changes in your facility. TRC conducted this study as part of a comprehensive effort to assist New Jersey school districts and local governments in controlling their energy costs and to help protect our environment by reducing statewide energy consumption.

BUILDING PERFORMANCE REPORT

Annual Energy Utilities	Costs: $2,304,665 Electricity: 6,914,412 kWh Natural Gas: 173,388 Therm Equivalents Water: 2,318,961 Gallons	
ENERGY STAR® Benchmarking Score	N/A *(1-100 scale)*	A standard energy use benchmark is not available for this facility type. This report contains suggestions about how to improve building performance and reduce energy costs.



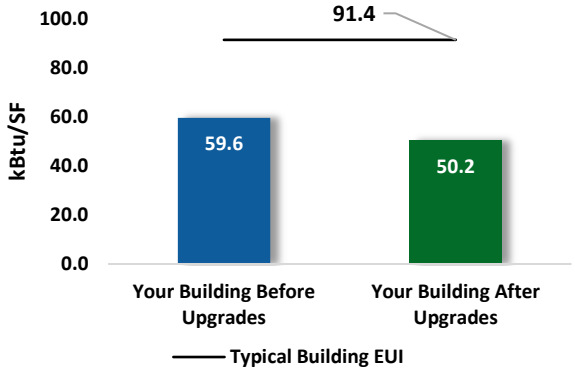
Energy Use by System

POTENTIAL IMPROVEMENTS

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

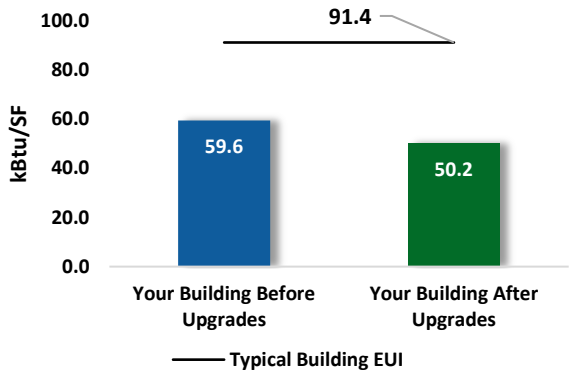
Scenario 1: Full Package (All Evaluated Measures)

Installation Cost	$1,574,890
Potential Rebates & Incentives[1]	$75,280
Annual Cost Savings	$454,690
Annual Energy Savings	Electricity: 1,679,324 kWh Natural Gas: 7,215 Therms
Greenhouse Gas Emission Savings	888 Tons
Simple Payback	3.3 Years
Site Energy Savings (All Utilities)	16%



Scenario 2: Cost Effective Package[2]

Installation Cost	$1,515,790
Potential Rebates & Incentives	$73,080
Annual Cost Savings	$453,758
Annual Energy Savings	Electricity: 1,675,709 kWh Natural Gas: 7,215 Therms
Greenhouse Gas Emission Savings	886 Tons
Simple Payback	3.2 Years
Site Energy Savings (all utilities)	16%



On-site Generation Potential

Photovoltaic	Medium
Combined Heat and Power	None

[1] Incentives are based on previously run state rebate programs. Contact your utility provider for current program incentives that may apply.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**693,758**	**121.8**	**-145**	**$174,499**	**$208,580**	**$34,320**	**$174,260**	**1.0**	**681,624**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	693,758	121.8	-145	$174,499	$208,580	$34,320	$174,260	1.0	681,624
Lighting Control Measures			**40,309**	**8.7**	**-8**	**$10,139**	**$38,130**	**$4,610**	**$33,520**	**3.3**	**39,604**
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	40,309	8.7	-8	$10,139	$38,130	$4,610	$33,520	3.3	39,604
Variable Frequency Drive (VFD) Measures			**447,250**	**111.3**	**0**	**$115,311**	**$540,500**	**$33,100**	**$507,400**	**4.4**	**450,377**
ECM 3	Install VFDs on Constant Volume (CV) Fans	Yes	413,073	108.0	0	$106,500	$517,900	$29,800	$488,100	4.6	415,961
ECM 4	Install VFDs on Water Supply Pump	Yes	34,177	3.3	0	$8,812	$22,600	$3,300	$19,300	2.2	34,416
Unitary HVAC Measures			**2,217**	**1.5**	**0**	**$572**	**$14,800**	**$800**	**$14,000**	**24.5**	**2,232**
ECM 5	Install High Efficiency Air Conditioning Units	No	2,217	1.5	0	$572	$14,800	$800	$14,000	24.5	2,232
Electric Chiller Replacement			**1,398**	**-2.1**	**0**	**$360**	**$44,300**	**$1,400**	**$42,900**	**119.0**	**1,408**
ECM 6	Install High Efficiency Chillers	No	1,398	-2.1	0	$360	$44,300	$1,400	$42,900	119.0	1,408
HVAC System Improvements			**5,588**	**0.0**	**0**	**$1,441**	**$660**	**$120**	**$540**	**0.4**	**5,627**
ECM 7	Install Pipe Insulation	Yes	5,588	0.0	0	$1,441	$660	$120	$540	0.4	5,627
Domestic Water Heating Upgrade			**556**	**0.0**	**0**	**$143**	**$690**	**$330**	**$360**	**2.5**	**560**
ECM 8	Install Low-Flow DHW Devices	Yes	556	0.0	0	$143	$690	$330	$360	2.5	560
Food Service & Refrigeration Measures			**22,646**	**2.6**	**0**	**$5,839**	**$6,430**	**$600**	**$5,830**	**1.0**	**22,805**
ECM 9	Vending Machine Control	Yes	22,646	2.6	0	$5,839	$6,430	$600	$5,830	1.0	22,805
Custom Measures			**465,603**	**0.0**	**875**	**$146,386**	**$720,800**	**$0**	**$720,800**	**4.9**	**571,309**
ECM 10	Retro-Commissioning Study	Yes	347,429	0.0	875	$115,916	$691,800	$0	$691,800	6.0	452,309
ECM 11	Replace Electric Water Heater with Heat Pump Water Heater	Yes	118,174	0.0	0	$30,470	$29,000	$0	$29,000	1.0	119,000
TOTALS (COST EFFECTIVE MEASURES)			**1,675,709**	**244.3**	**722**	**$453,758**	**$1,515,790**	**$73,080**	**$1,442,710**	**3.2**	**1,771,906**
TOTALS (ALL MEASURES)			**1,679,324**	**243.7**	**722**	**$454,690**	**$1,574,890**	**$75,280**	**$1,499,610**	**3.3**	**1,775,546**

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

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

All Evaluated Energy Improvements[3]

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

[3] TRC bases estimated material and labor costs primarily on RS Means cost manuals as well as on our experience at similar facilities. This approach is based on standard cost estimating manuals and is vendor neutral. Cost estimates include material and labor pricing associated with one for one equipment replacements. Cost estimates do not include demolition or removal of hazardous waste. The actual implementation costs for energy savings projects are anticipated to be significantly higher based on the specific conditions at your site(s). We strongly recommend that you work with your design engineer or contractor to develop actual project costs for your specific scope of work for the installation of high efficiency equipment. We encourage you to obtain multiple estimates when considering measure installations.

1.1 Planning Your Project

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

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

Pick Your Installation Approach

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

Options from Your Utility Company

Prescriptive and Custom Rebates

For facilities wishing to pursue only selected individual measures (or planning to phase implementation of selected measures over multiple years), incentives are available through the Prescriptive and Custom Rebates program. To participate, you can use internal resources or an outside firm or contractor to perform the final design of the ECM(s) and install the equipment. Program pre-approval may be required for some incentives. Contact your utility company for more details prior to project installation.

Direct Install

The Direct Install program provides turnkey installation of multiple measures through an authorized contractor. This program can provide incentives up to 70% or 80% of the cost of selected measures. A Direct Install contractor will assess and verify individual measure eligibility and perform the installation work. The Direct Install program is available to sites with an average peak demand of less than 200 kW.

Engineered Solutions

The Engineered Solutions program provides tailored energy-efficiency assistance and turnkey engineering services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. The program provides all professional services from audit, design, construction administration, to commissioning and measurement and verification for custom whole-building energy-efficiency projects. Engineered Solutions allows you to install as many measures as possible under a single project as well as address measures that may not qualify for other programs.

For more details on these programs please contact your utility provider.

Options from New Jersey's Clean Energy Program

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

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

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

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

Successor Solar Incentive Program (SuSI)

New Jersey is committed to supporting solar energy. Solar projects help the state reach the renewable goals outlined in the state's Energy Master Plan. The SuSI program is used to register and certify solar projects in New Jersey. Rebates are not available, but certified solar projects are able to earn one SREC II (Solar Renewable Energy Certificates II) for each megawatt-hour of solar electricity produced from a qualifying solar facility.

Ongoing Electric Savings with Demand Response

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

Large Energy User Program (LEUP)

LEUP is designed to promote self-investment in energy efficiency for the largest energy consumers in the state. Customers in this category spend about $5 million a year on energy bills. This program incentivizes owners/users of buildings to upgrade or install energy conserving measures in existing buildings to help offset the capital costs associated with the project. The efficiency upgrades are customized to meet the requirements of the customers' existing facilities, while advancing the State's energy efficiency, conservation, and greenhouse gas reduction goals.

For more details on these programs please visit New Jersey's Clean Energy Program website.

2 Existing Conditions

The New Jersey Board of Public Utilities (NJBPU) has sponsored this Local Government Energy Audit (LGEA) report for 225 E State Street. This report provides information on how your facility uses energy, identifies energy conservation measures (ECMs) that can reduce your energy use, and provides information and assistance to help you implement the ECMs.

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

2.1 Site Overview

On October 3rd, 2024, TRC performed an energy audit at 225 E State Street and the Trenton Office Complex Parking Garage located in Trenton, New Jersey. TRC met with Don Nawn to review the facility operations and help focus our investigation on specific energy-using systems.

225 E State Street is a 9-story, 373,000 square foot building built in 1991. The attached parking garage is 291,000 square feet. Spaces include corridors/stairwells, office areas, conference rooms, electrical/telecom rooms, break rooms, mailroom, retail spaces, storage rooms, main lobby reception area, and mechanical spaces.

The office building lighting is mainly provided by linear fluorescent T8 fixtures and biaxial CFL fixtures while garage lighting is provided by LED sources. Heating hot water and chilled water are provided by the Vicinity Energy Power Plant. Heating and cooling are provided by air handling units (AHUs) distributed throughout the building. The building has several passenger elevators and a freight elevator. A 75-kilowatt oil backup generator provides emergency power for lighting and elevators. There are six Level 2 electric vehicle charging stations installed in the parking garage and IT network equipment in the office building. The building is served by multiple electric meters, many of which serve tenant areas.

Recent Improvements and Facility Concerns

The facility maintenance staff noted during the facility interview process that the existing building management system was to be updated at the beginning of October 2024. Additionally, there are plans to improve/update the office building's roof.

2.2 Building Occupancy

The facility is occupied seven days a week during regular business hours with some areas occupied during late night and weekend periods. Janitorial services are performed after hours.

Building Name	Weekday/Weekend	Operating Schedule
Motor Vehicle Commission - General Operational Hours	Weekday	7:00 AM - 8:30 PM
	Weekend	6:00 AM - 3:00 PM

Building Occupancy Schedule

2.3 Building Envelope

Building walls are concrete block over structural steel with a mix of plaster and stucco coverings. The tiered flat roof is supported with steel trusses and a metal deck. It is finished with an insulated layer of at least 1.5"and a covering of EDPM.

Most of the windows are double glazed and have aluminum frames with a thermal break. The glass-to-frame seals are in fair to good condition. The operable window weather seals are in fair to good condition, showing little evidence of excessive wear. Most office windows are equipped with blinds or solar shades for glare control.

Exterior doors have aluminum frames and consist of a mix of solid metal exterior doors and glass storefront-style doors. All exterior doors are in fair to good condition with undamaged seals. Degraded window and door seals increase drafts and outside air infiltration.

Typical Building Exterior Walls & Front Entrance Glass

Main Building Roof with Black Rubber Membrane


Typical Exterior Windows & Window Coverings


Typical Building Exterior Doors


Parking Garage Exterior Walls & Flat Roof with Parking Space

2.4 Lighting Systems

The primary interior lighting system in the main office building uses 32-Watt linear fluorescent T8 lamps. Fixture types include 2- 3- or 4-lamp, 4-foot long recessed and surface mounted fixtures. Typically, T8 fluorescent lamps use electronic ballasts. Additionally, there are a significant number of 40-Watt biaxial compact fluorescent lamps (CFL) installed throughout the facility's office spaces and corridors. There are some small sized CFL, LED, and incandescent general-purpose lamps as well.

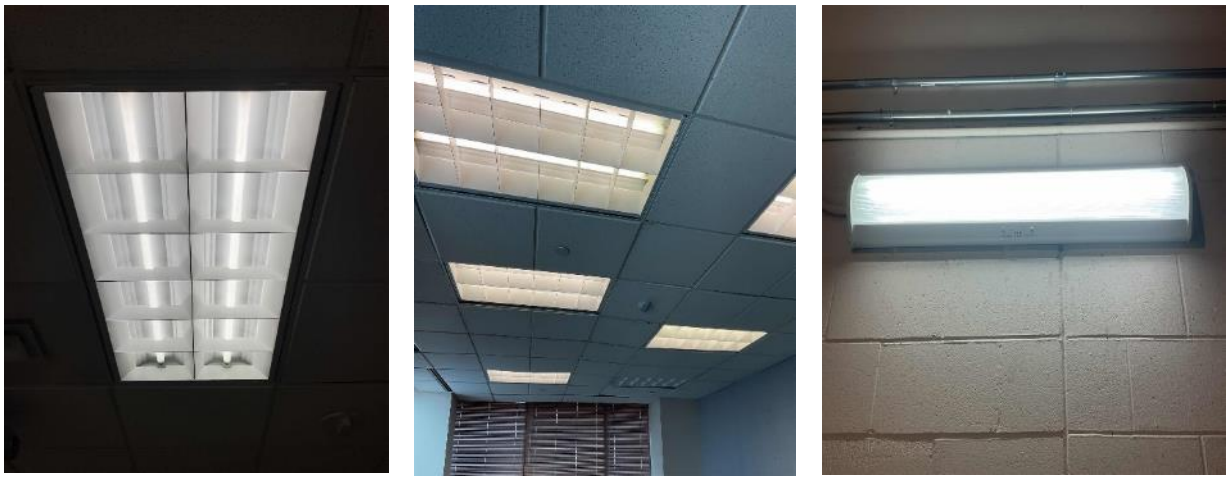
The primary lighting system found in the parking garage uses 60-Watt LED fixtures. Additionally, there are some 40-Watt 2'x2' LED light panels. The garage stairwells contain14.5-Watt, 4-foot LED light fixtures. Other LED sources of various types and wattages provide perimeter and general lighting.

All exit signs are LED. Most fixtures are in fair to good condition. Interior lighting levels were generally sufficient.

Light fixtures in most office spaces, corridors, and stairwells are controlled by an automated whole-building lighting control system. This system uses timers to control the lighting to operate during standard occupied hours. Lighting can be manually overridden on using tri-level wall switches that engage the desired lighting system for two hours before automatically shutting down again.

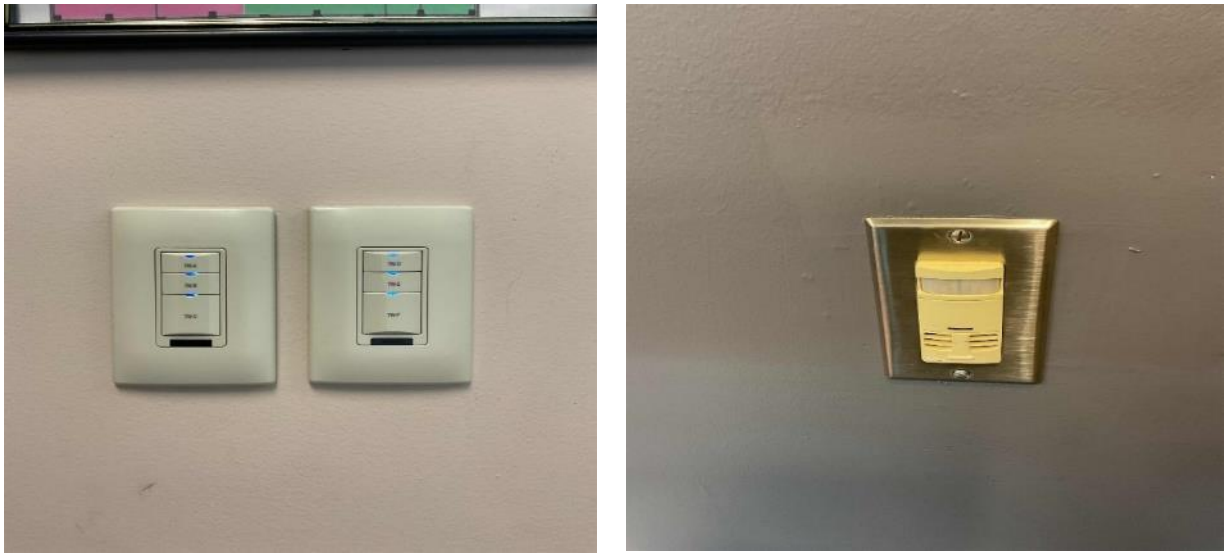
In other areas, lighting systems are controlled by a mix of wall mounted occupancy sensors, ceiling mounted occupancy sensors, and manual wall switches.

Exterior fixtures include LED wallpacks and pole mounted flood fixtures incorporating LED lamps. Exterior light fixtures are controlled by a time clock or photocell, depending on the fixture.

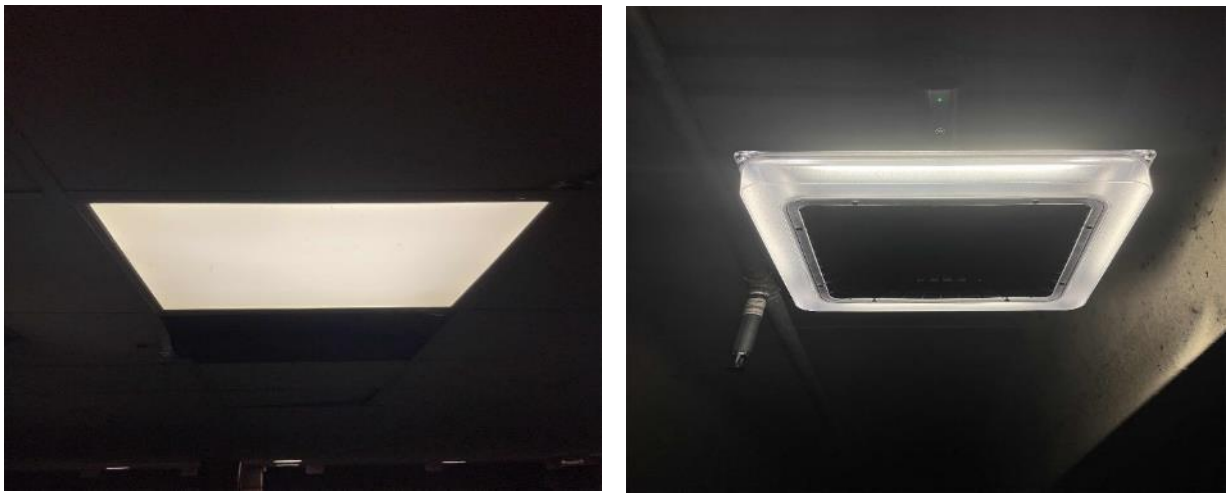


Left & Center: *Typical T8 Linear Fluorescent Fixtures,* ***Right:*** *LED Fixtures in Stairwells*

Typical Incandescent, CFL Screw-In Lights and Fluorescent Fixtures



***Left:** Wall Switches Connected to Watt Stopper Automation System, **Right:** Typical Occupancy Sensor*



Typical LED Fixtures in Parking Garage

LED Wall Packs and Pole Lights in Parking Garage

2.5 Air Handling Systems

Unitary Electric HVAC Equipment

The facility's main server room on the sixth floor uses two portable MovinCool air conditioning (AC) units. These units are each rated to provide one ton of cooling capacity with a seasonal energy efficiency rating (SEER) of 10. The units are in good condition and are not ENERGY STAR labeled.

MovinCool Portable Air Conditioner Installed in Server Room

Unitary Heating Equipment

Building vestibules and stairwells are heated by electric resistance heaters. These vary in capacity between 3- and 10- kW. The units are in good to fair condition. Equipment is controlled by a manual dial thermostat.

There are additional unit heaters installed in the loading bays and service corridors on the building's first floor. These units are connected to the heating hot water system and are in fair condition.

Typical Hot Water Unit Heaters

Packaged Units

The building's various elevator rooms are served by York D2CE10 packaged roof top units (RTU). This unit has a rated cooling capacity of 10-tons with a seasonal efficiency rating (SEER) of approximately 10.3. It provides cooling and ventilation only. The unit is equipped with an economizer, is in poor condition, and is operating beyond its useful life.

York D2CE10 Roof Top Unit

Air Handling Units (AHUs)

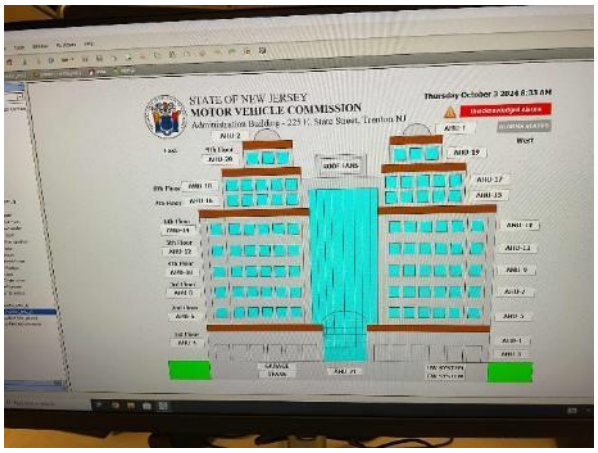
The building is conditioned by 22 York air handling units that are original to the building. These units are each equipped with a supply fan motor, hot water heating coil, and a cold-water coil for cooling. The units are located within mechanical rooms on each floor of the main office building and on the facility's roof. Please refer to the following table for additional information.

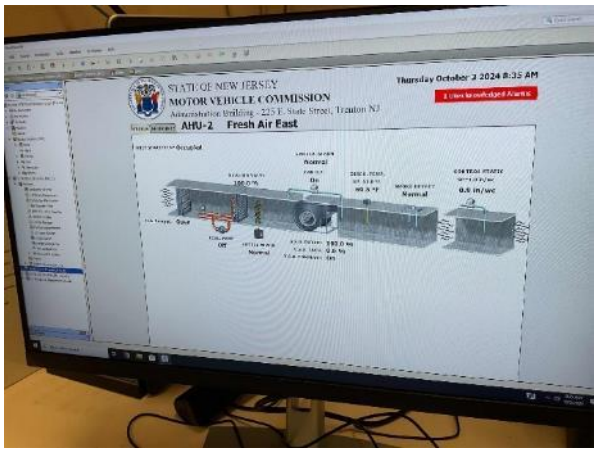
Location	Units	Areas Served	Motor Qty	Motor HP	VFD
MB-Exterior-Roof	AHU-1 & 2	various interior spaces	2	30.00	No
MB-Mechanical-Fan Rms	AHU-3 & 4	1st floor east and west wings	2	40.00	Yes
MB-Mechanical-Fan Rms	AHU-5 & 6	2nd floor	2	40.00	Yes
MB-Mechanical-Fan Rms	AHU-7 & 8	3rd floor	2	40.00	Yes
MB-Mechanical-Fan Rms	AHU-9 & 10	4th floor	2	40.00	Yes
MB-Mechanical-Fan Rms	AHU-11 & 12	5th floor	2	40.00	Yes
MB-Mechanical-Fan Rms	AHU-13 & 14	6th floor	2	40.00	Yes
MB-Mechanical-Fan Rms	AHU-15 & 16	7th floor	2	20.00	Yes
MB-Mechanical-Fan Rms	AHU-17 & 18	8th floor	2	20.00	Yes
MB-Mechanical-Fan Rms	AHU-19-20	9th floor	2	20.00	Yes
MB-Mechanical-Fan Rms	AHU-21	various interior spaces	1	3.00	Yes
MB-Mechanical-Fan Rm Mezzanine	ACD-1	mezzanine office spaces	1	10.00	Yes

In addition to the larger AHU's installed in the mechanical rooms, the telecommunication closets on each floor of the building are cooled by a series of McQuay air handling units. These units are connected to the building's chilled water system and only provide cooling. The supply fan motors for these units range between 0.05 hp to 1.5 hp. They are not equipped with VFDs.

Left: *Typical York Air Handler &* ***Right:*** *Typical AHU Motor with Attached VFD*

Typical McQuay AH in Tele-Comm Closets





Left: *Facility AHU Layout in BAS,* ***Right:*** *Typical AHU Configuration*

2.6 Heating Hot Water Systems

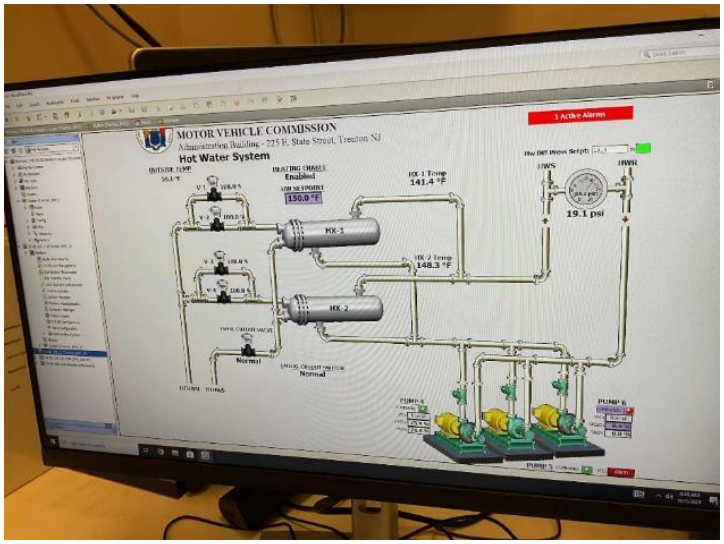
The building's heating demand is met by the off-site Vicinity Energy Power Plant. Hot water is supplied by a remote boiler to the 2-pipe hydronic distribution system and fed through two heat exchangers before being supplied to building's air handling units. The heating hot water system is managed by the building's BAS and controlled by two 50 hp pumps and one 30 hp pump. All three pumps are equipped with VFDs and all heating hot water piping insulated.

At the time of inspection, hot water was being supplied at 150°F to building systems when the outside air temperature was 59°F. The temperature of the supply water is controlled manually by the building's maintenance staff depending on the desired conditions of the building's occupants.

Overview of Pump Room & Insulated Water Pipes

Typical Heating Hot Water Pump Motors

Heat Exchangers



BAS Screenshot: Heating Hot Water Distribution System Layout

2.7 Chilled Water Systems

The building's cooling demand is met by the off-site Vicinity Energy Power Plant. Chilled water is fed to the 2-pipe hydronic distribution system before being distributed to the various air handling units throughout the building. The chilled water system is managed by the building's BAS and controlled by three 50 hp chilled water pumps. These pumps are in fair condition and are equipped with VFDs. The chilled water pipes are insulated, and the insulation is in good condition.

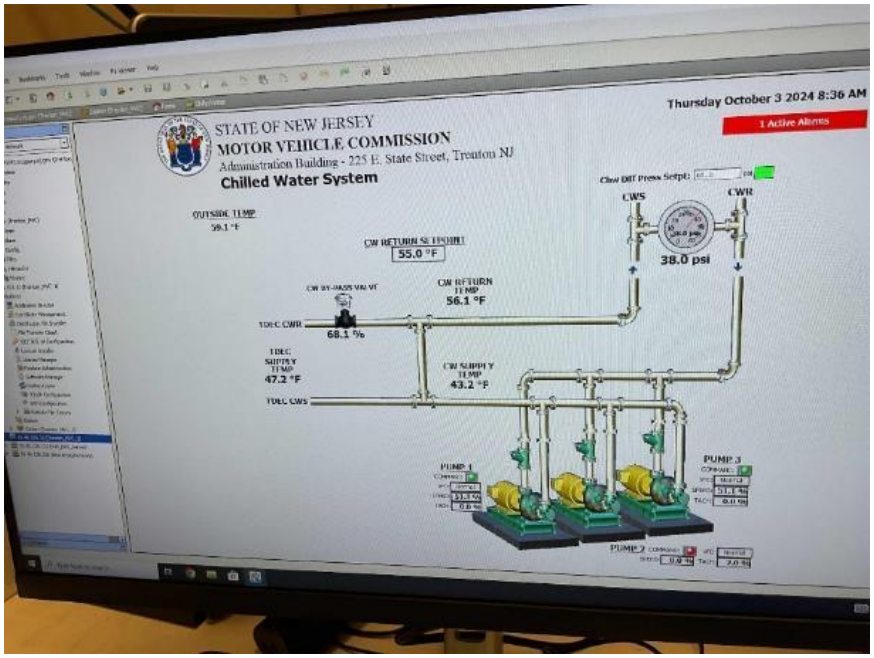
At the time of inspection, chilled water was being supplied at 43°F to building systems when the outside air temperature was 59°F. The temperature of the supply water is controlled manually by the building's maintenance staff depending on the desired conditions of the building's occupants.

There is a small constant speed Carrier air cooled serving the garage. It is operating beyond its useful life and has been evaluated for replacement

Typical Chilled Water Pump Motor with Attached VFD

Chilled Water Pipes with Insulation

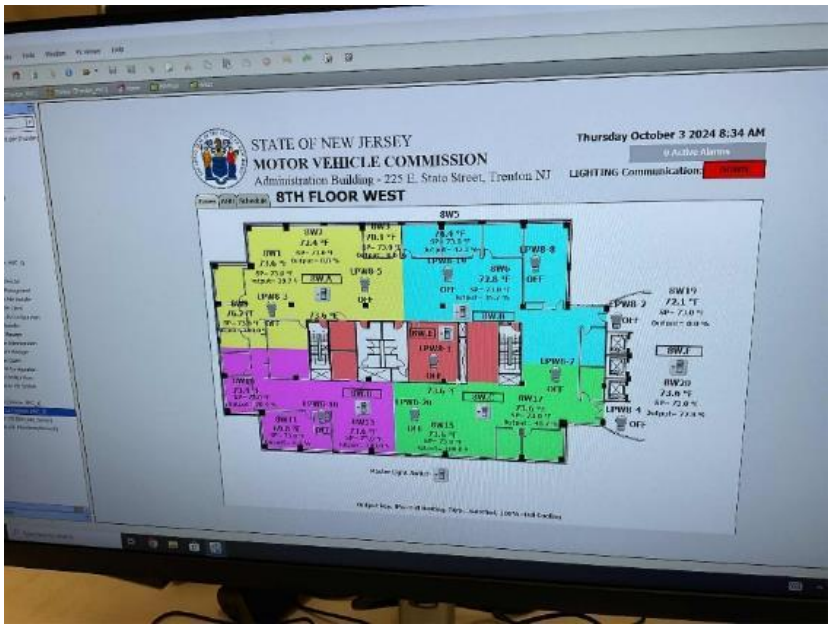
Garage Chiller Condensing Unit



BAS Screenshot: Chilled Water Distribution System Layout

2.8 Building Automation System (BAS)

A Niagara BAS controls the HVAC equipment, heating hot water distribution system, chilled water distribution system, and building's exhaust fans. The BAS provides equipment scheduling control, monitors and controls space temperatures, supply air temperatures, humidity, heating water loop temperatures, and chilled water loop temperatures. The BAS is also capable of controlling the building's lighting through the Watt Stopper lighting control system.



BAS Screenshot: Typical Office Control Scheme with Lighting Controls

2.9 Domestic Hot Water

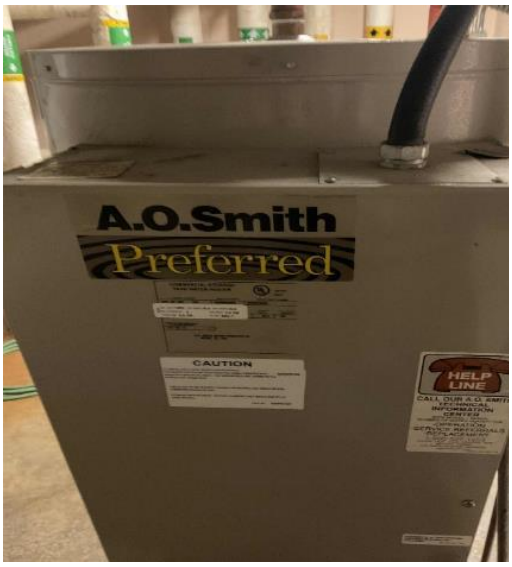
Hot water is produced by a variety of 40- and 80-gallon electric storage water heaters with varying input capacities.

Area Served	Tank Capacity (gallons)	Input Capacity (kW)	Installation Year
East Mezzanine	40 Gallons	6 kW	2016
West 1st Floor	40 Gallons	5 kW	2019
East 2nd & 3rd Floors	80 Gallons	6 kW	2019
West 2nd & 3rd Floors	80 Gallons	6 kW	2019
East 4th, 5th, & 6th Floors	80 Gallons	9 kW	2005
West 4th, 5th, & 6th Floors	80 Gallons	9 kW	2016
East 7th, 8th, & 9th Floors	80 Gallons	9 kW	2005
West 7th, 8th, & 9th Floors	80 Gallons	9 kW	2016

In addition to the storage tank water heaters, several Hubbell tankless electric water heaters are installed in many of the unisex single restrooms throughout the building.

Six 0.17 hp circulation pumps distribute water to end uses. The circulation pumps operate continuously. The domestic hot water pipes are partially insulated. The insulation is in fair to good condition.

Typical Storage Tank Electric Water Heater



Typical Storage Tank Electric Water Heater

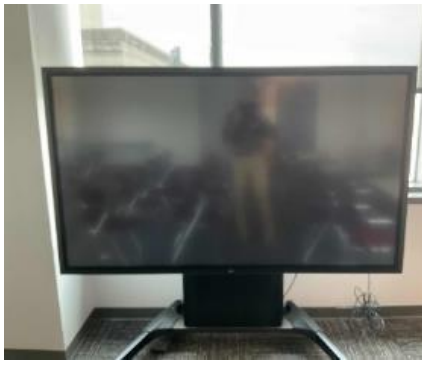
Typical Domestic Hot Water Circulation Pump

2.10 Plug Load and Vending Machines

You may wish to consider paying particular attention to minimizing your plug load usage. This report makes suggestions for ECMs in this area as well as energy efficient best practices.

There are approximately 1,045 computer workstations throughout the facility. Plug loads include general cafe and office equipment. There are six Level 2 electric vehicle charging stations installed in the parking garage and IT network equipment in the office building. Tenant areas have various food service equipment.

There are several residential style refrigerators that are used to store staff meals. These vary in condition and efficiency. There are 12 refrigerated beverage vending machines and 12 non-refrigerated vending machines throughout. Vending machines are not equipped with occupancy-based controls.



Typical Plug Load Fixtures

Typical Refrigerated & Non-Refrigerated Vending Machines

2.11 Water-Using Systems

Water is provided by a municipal water supply company. Potable water is used for drinking, cleaning, sanitary fixtures, and building conditioning. Water leaks were not observed/reported.

EPA WaterSense® has set maximum flow rates for sanitary fixtures. They are 1.28 gallons per flush (gpf) for toilets, 0.5 gpf for urinals, 1.5 gallons per minute (gpm) for lavatory faucets, and 2.0 gpm for showerheads. There are 40 restrooms with toilets, urinals, and sinks. Most faucet flow rates are at 0.5 gallons per minute (gpm) or higher. Toilets are rated at 1.6 gallons per flush (gpf) and urinals are rated at 1.0 gpf.

Typical Restroom Faucets

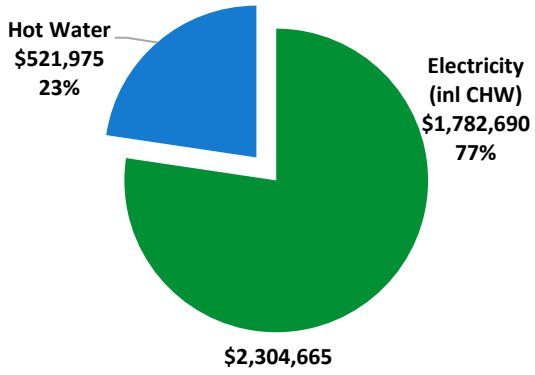

Typical Restroom Toilets & Urinals

3 Energy and Water Use and Costs

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

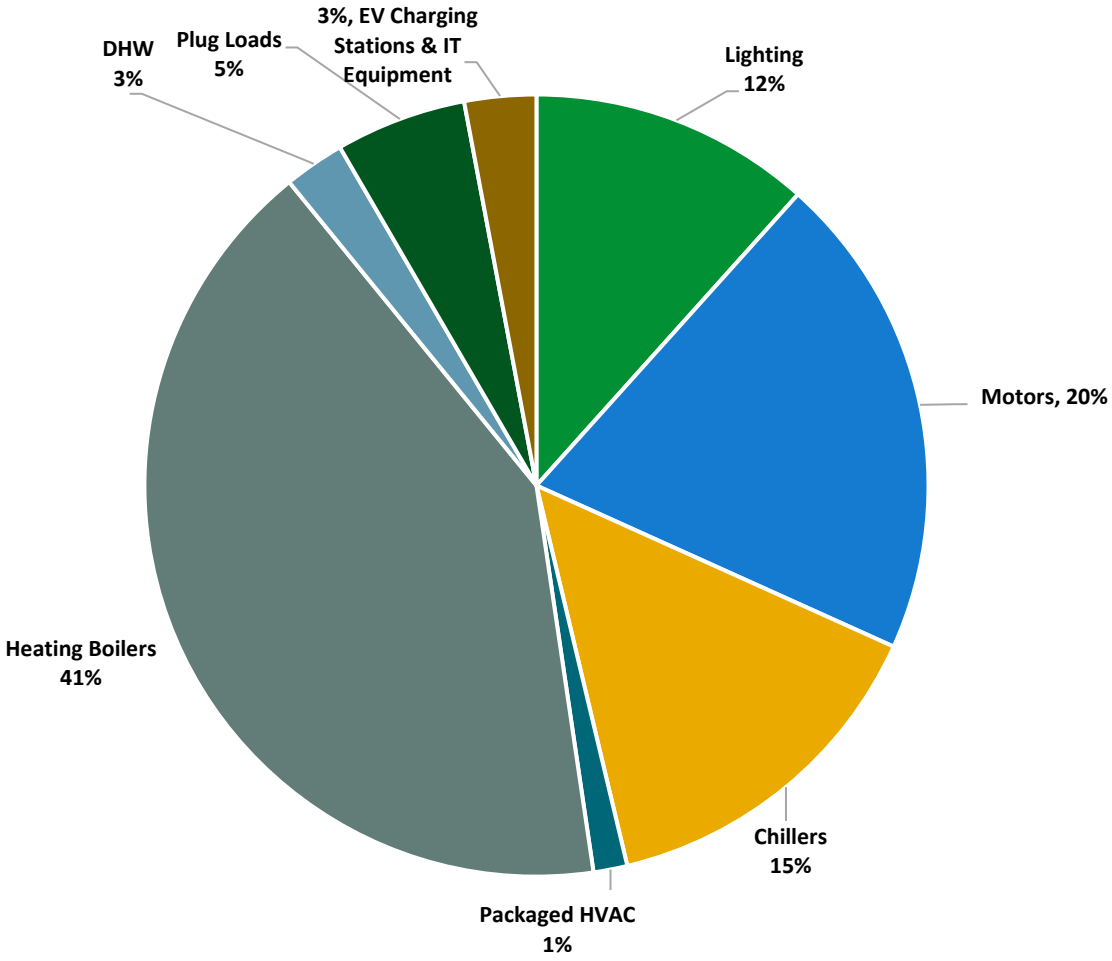
Utility Summary		
Fuel	**Usage**	**Cost**
Electricity	6,914,412 kWh	$1,782,690
Natural Gas	173,388 Therms [1]	$521,975
Total		**$2,304,665**

[1] Therm equivalents derived from hot water heat content as provided by Vicinity.



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

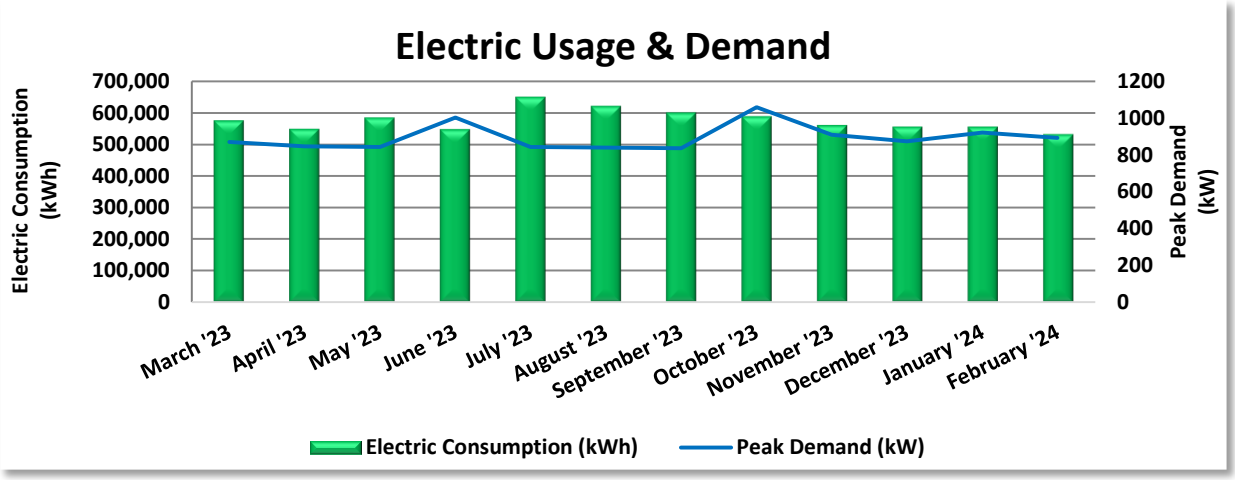
The energy auditor collects information regarding equipment operating hours, capacity, efficiency, and other operational parameters from facility staff, drawings, and on-site observations. This information is used as the inputs to calculate the existing conditions energy use for the site. The calculated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



Energy Balance by System

3.1 Electricity

PSE&G delivers electricity under rate class Large Power & Lighting Secondary (LPLS), with electric production provided by Direct Energy, a third-party supplier.



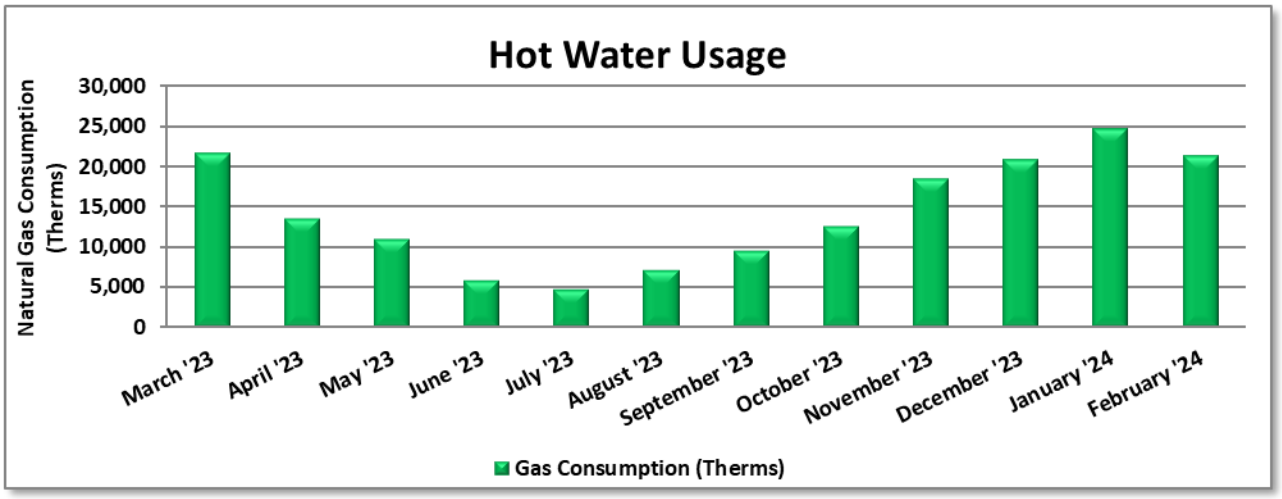
Electric Billing Data					
Period Ending	Days in Period	Electric Usage (kWh)	Demand (kW)	Demand Cost	Total Electric Cost
4/13/23	30	574,803	871	$3,748	$104,356
5/12/23	29	547,822	846	$3,638	$100,602
6/13/23	32	584,180	843	$4,101	$177,234
7/13/23	30	547,213	1,004	$11,776	$184,429
8/11/23	29	649,628	844	$11,130	$251,078
9/12/23	32	620,752	841	$10,860	$241,842
10/11/23	29	599,706	836	$10,716	$220,532
11/8/23	28	588,148	1,060	$5,074	$115,194
12/12/23	34	560,092	909	$4,323	$103,612
1/12/24	31	554,757	873	$4,165	$95,864
2/12/24	31	555,476	922	$4,403	$93,943
3/13/24	30	531,836	892	$4,260	$94,004
Totals	**365**	**6,914,412**	**1,060**	**$78,194**	**$1,782,690**
Annual	**365**	**6,914,412**	**1,060**	**$78,194**	**$1,782,690**

Notes:

- Peak demand of 1,060 kW occurred in October '23, however, peak demand excludes the demand associated with generating chilled water.
- Average demand over the past 12 months was 895 kW.
- The average electric cost over the past 12 months was $0.258/kWh, which is the blended rate that includes energy supply, distribution, demand, and other charges. This report uses this blended rate to estimate energy cost savings.
- Electricity consumption includes tenant meters and energy derived from the Vicinity Energy chilled water service assuming delivery at 0.8 kW/ton.

3.2 Hot Water

Vicinity Energy delivers heating hot water under the rate class Trenton Thermal Rate Schedule.



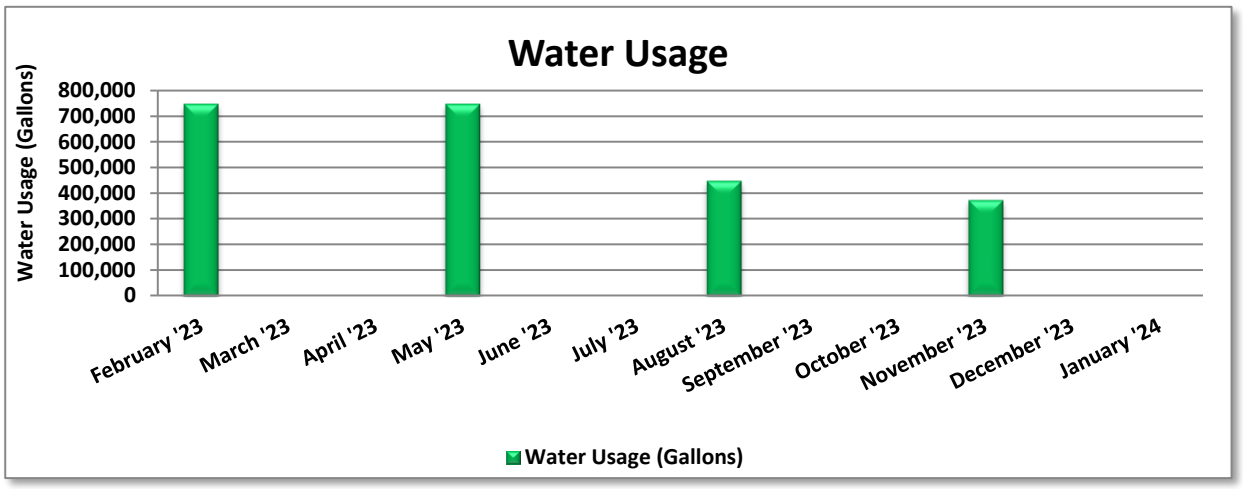
Hot Water Billing Data			
Period Ending	Days in Period	Natural Gas Usage (Therms)	Natural Gas Cost
3/31/23	28	21,773	$56,724
4/30/23	30	13,573	$41,013
5/31/23	31	11,032	$36,556
6/30/23	30	6,015	$27,903
7/31/23	31	4,839	$26,385
8/31/23	31	7,198	$30,737
9/30/23	30	9,601	$35,212
10/31/23	31	12,698	$41,147
11/30/23	30	18,543	$50,927
12/31/23	31	21,001	$54,726
1/31/24	31	24,782	$60,557
2/29/24	29	21,383	$57,228
Totals	**363**	**172,438**	**$519,115**
Annual	**365**	**173,388**	**$521,975**

Notes:

- The average gas cost for the past 12 months is $3.010/therm, which is the blended rate used throughout the analysis.
- Natural gas usage is derived from Vicinity Energy provided heating hot water service, billed in MMBtu.
- The building does not receive direct natural gas service.

3.3 Water

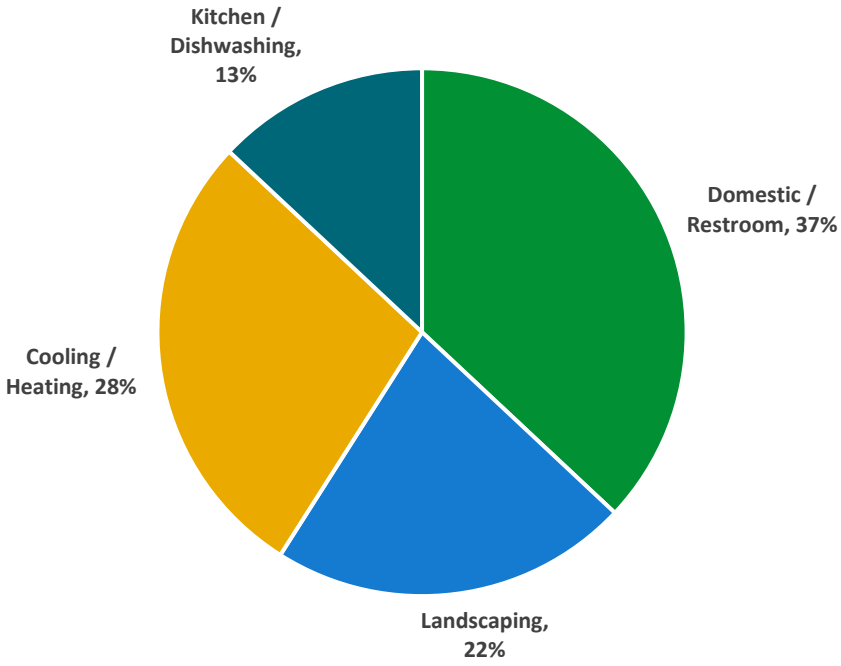
Trenton Water Works delivers water to the project site.



Water Billing Data			
Period Ending	**Days in Period**	**Water Usage (gallons)**	**Water Cost**
3/1/23	28	748,052	$11,971
4/1/23	31	0	$0
5/1/23	30	0	$0
6/1/23	31	748,052	$12,569
7/1/23	30	0	$0
8/1/23	31	0	$0
9/1/23	31	448,831	$10,179
10/1/23	30	0	$0
11/1/23	31	0	$0
12/1/23	30	374,026	$9,581
1/1/24	31	0	$0
2/1/24	31	0	$0
Totals	**365**	**2,318,961**	**$44,300**
Annual	**365**	**2,318,961**	**$44,300**

Notes:

- The average cost of water for the past 12 months is $0.0191/gal.
- Billing data is at intervals and does not specifically reflect monthly usage patterns.



Typical Office Water End Use[4]

[4] Chart is of typical water end use and not specific to the facility

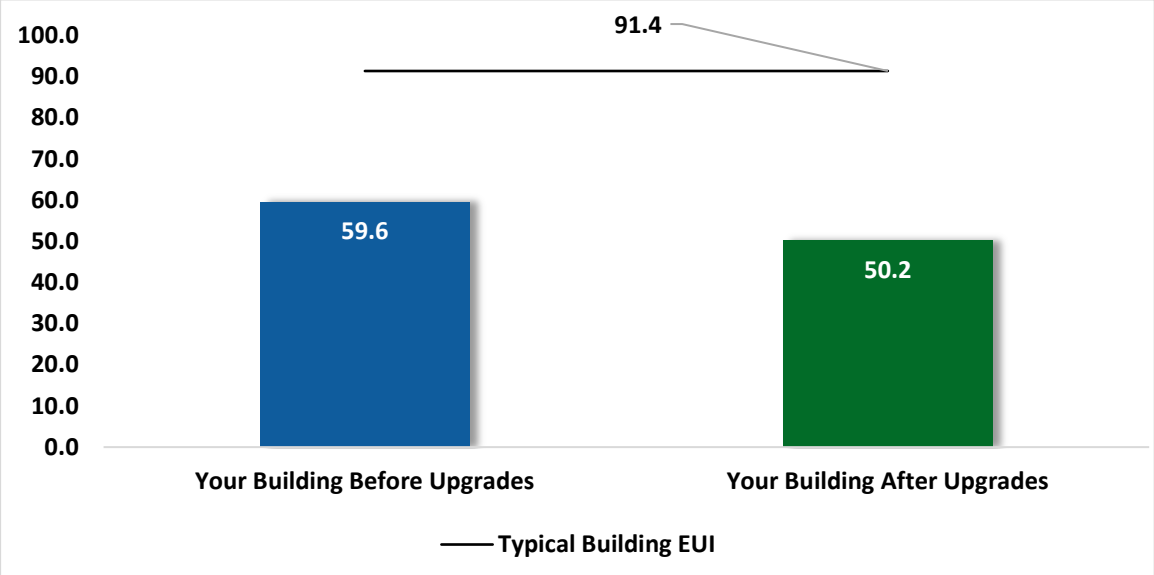
3.4 Benchmarking

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

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

Benchmarking Score	N/A

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

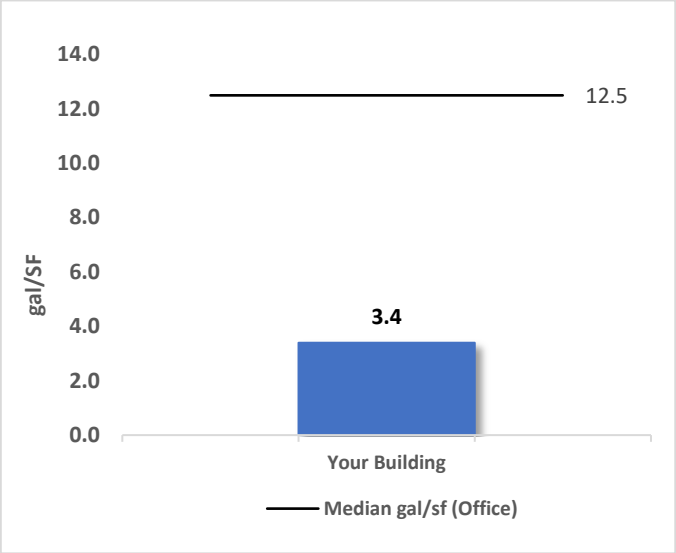


Energy Use Intensity Comparison[5]

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

[5] Based on all evaluated ECMs

Water Benchmarking



A benchmark is provided for your building's water use based on the annual water use in gallons per square foot of building area (gal/sf-yr). Your building is compared to other similar buildings based on average water usage as available from the 2012 Commercial Buildings Energy Consumption Survey (CBECS) and from the EPA ENERGY STAR DataTrends Water Use Tracking database.

Water use varies considerably depending mainly on the extent of outdoor water use and whether process water is used, such as for vehicle washing and for laboratory sterilizers. Cooling towers and steam boilers are also significant water users. Kitchens and sanitary fixtures may use varying amounts of water.

Tracking your Energy Performance

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

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

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

For more information on ENERGY STAR and Portfolio Manager, visit their website.

3.5 Understanding Your Utility Bills

The State of New Jersey Department of the Public Advocate provides detailed information on how to read natural gas and electric bills. Your bills contain important information including account numbers, meter numbers, rate schedules, meter readings, and the supply and delivery charges. Gas and electric bills both provide comparisons of current energy consumption with prior usage.

Sample bills, with annotation, may be viewed at:
https://www.nj.gov/rpa/docs/Understanding_Electric_Bill.pdf
https://www.nj.gov/rpa/docs/Understanding_Gas_Bill.pdf

Why Utility Bills Vary

Utility bills vary from one month to another for many reasons. For this reason, assessing the effects of your energy savings efforts can be difficult.

Billing periods vary, typically ranging between 28 and 33 days. Electric bills provide the kilowatt-hours (kWh) used per month while gas bills provide therms (or hundreds of cubic feet - CCF) per month consumption information. Monthly consumption information can be helpful as a tool to assess your efforts to reduce energy, particularly when compared to monthly usage from a similar calendar period in a prior year.

Bills typically vary seasonally, often with more gas consumed in the winter for heating, and more electricity used in the summer when air conditioning is used. Facilities with electric heating may experience higher electricity use in the winter. Seasonal variance will be impacted by the type of heating and cooling systems used. Normal seasonal fluctuations are further impacted by the weather. Extremely cold or hot weathers causes HVAC equipment to run longer, increasing usage. Other monthly fluctuations in usage can be caused by changes in building occupancy. Utility bills provide a comparison of usage between the current period and comparable billing month period of the prior year. Year-to-year monthly use comparisons can point to trends with energy savings for measures/projects that were implemented within the timeframe, but these comparisons do not account for changing weather of occupancy patterns.

The price of fuel and purchased power used to produce and delivery electricity and gas fluctuates. Any increase or decrease in these costs will be reflected in your monthly bill. Additionally, billing rates occasionally change after justification and approval of the NJBPU. For this reason, it is more useful to review energy use rather than cost when assessing energy use trends or the impact of energy conservation measures implemented.

4 Energy Conservation Measures

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

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

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

Financial incentives in this report are based on the previously run state rebate program SmartStart, which has been retired. Now, all investor-owned gas and electric utility companies are offering complementary energy efficiency programs directly to their customers. Some measures and proposed upgrades may be eligible for higher incentives than those shown below. The incentives in the summary tables should be used for high-level planning purposes. To verify incentives, reach out to your utility provider or visit the NJCEP website for more information.

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

#	Energy Conservation Measure	Cost Effective?	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades			**693,758**	**121.8**	**-145**	**$174,499**	**$208,580**	**$34,320**	**$174,260**	**1.0**	**681,624**
ECM 1	Retrofit Fixtures with LED Lamps	Yes	693,758	121.8	-145	$174,499	$208,580	$34,320	$174,260	1.0	681,624
Lighting Control Measures			**40,309**	**8.7**	**-8**	**$10,139**	**$38,130**	**$4,610**	**$33,520**	**3.3**	**39,604**
ECM 2	Install Occupancy Sensor Lighting Controls	Yes	40,309	8.7	-8	$10,139	$38,130	$4,610	$33,520	3.3	39,604
Variable Frequency Drive (VFD) Measures			**447,250**	**111.3**	**0**	**$115,311**	**$540,500**	**$33,100**	**$507,400**	**4.4**	**450,377**
ECM 3	Install VFDs on Constant Volume (CV) Fans	Yes	413,073	108.0	0	$106,500	$517,900	$29,800	$488,100	4.6	415,961
ECM 4	Install VFDs on Water Supply Pump	Yes	34,177	3.3	0	$8,812	$22,600	$3,300	$19,300	2.2	34,416
Unitary HVAC Measures			**2,217**	**1.5**	**0**	**$572**	**$14,800**	**$800**	**$14,000**	**24.5**	**2,232**
ECM 5	Install High Efficiency Air Conditioning Units	No	2,217	1.5	0	$572	$14,800	$800	$14,000	24.5	2,232
Electric Chiller Replacement			**1,398**	**-2.1**	**0**	**$360**	**$44,300**	**$1,400**	**$42,900**	**119.0**	**1,408**
ECM 6	Install High Efficiency Chillers	No	1,398	-2.1	0	$360	$44,300	$1,400	$42,900	119.0	1,408
HVAC System Improvements			**5,588**	**0.0**	**0**	**$1,441**	**$660**	**$120**	**$540**	**0.4**	**5,627**
ECM 7	Install Pipe Insulation	Yes	5,588	0.0	0	$1,441	$660	$120	$540	0.4	5,627
Domestic Water Heating Upgrade			**556**	**0.0**	**0**	**$143**	**$690**	**$330**	**$360**	**2.5**	**560**
ECM 8	Install Low-Flow DHW Devices	Yes	556	0.0	0	$143	$690	$330	$360	2.5	560
Food Service & Refrigeration Measures			**22,646**	**2.6**	**0**	**$5,839**	**$6,430**	**$600**	**$5,830**	**1.0**	**22,805**
ECM 9	Vending Machine Control	Yes	22,646	2.6	0	$5,839	$6,430	$600	$5,830	1.0	22,805
Custom Measures			**465,603**	**0.0**	**875**	**$146,386**	**$720,800**	**$0**	**$720,800**	**4.9**	**571,309**
ECM 10	Retro-Commissioning Study	Yes	347,429	0.0	875	$115,916	$691,800	$0	$691,800	6.0	452,309
ECM 11	Replace Electric Water Heater with Heat Pump Water Heater	Yes	118,174	0.0	0	$30,470	$29,000	$0	$29,000	1.0	119,000
TOTALS			**1,679,324**	**243.7**	**722**	**$454,690**	**$1,574,890**	**$75,280**	**$1,499,610**	**3.3**	**1,775,546**

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

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

All Evaluated ECMs

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**693,758**	**121.8**	**-145**	**$174,499**	**$208,580**	**$34,320**	**$174,260**	**1.0**	**681,624**
ECM 1	Retrofit Fixtures with LED Lamps	693,758	121.8	-145	$174,499	$208,580	$34,320	$174,260	1.0	681,624
Lighting Control Measures		**40,309**	**8.7**	**-8**	**$10,139**	**$38,130**	**$4,610**	**$33,520**	**3.3**	**39,604**
ECM 2	Install Occupancy Sensor Lighting Controls	40,309	8.7	-8	$10,139	$38,130	$4,610	$33,520	3.3	39,604
Variable Frequency Drive (VFD) Measures		**447,250**	**111.3**	**0**	**$115,311**	**$540,500**	**$33,100**	**$507,400**	**4.4**	**450,377**
ECM 3	Install VFDs on Constant Volume (CV) Fans	413,073	108.0	0	$106,500	$517,900	$29,800	$488,100	4.6	415,961
ECM 4	Install VFDs on Water Supply Pump	34,177	3.3	0	$8,812	$22,600	$3,300	$19,300	2.2	34,416
HVAC System Improvements		**5,588**	**0.0**	**0**	**$1,441**	**$660**	**$120**	**$540**	**0.4**	**5,627**
ECM 7	Install Pipe Insulation	5,588	0.0	0	$1,441	$660	$120	$540	0.4	5,627
Domestic Water Heating Upgrade		**556**	**0.0**	**0**	**$143**	**$690**	**$330**	**$360**	**2.5**	**560**
ECM 8	Install Low-Flow DHW Devices	556	0.0	0	$143	$690	$330	$360	2.5	560
Food Service & Refrigeration Measures		**22,646**	**2.6**	**0**	**$5,839**	**$6,430**	**$600**	**$5,830**	**1.0**	**22,805**
ECM 9	Vending Machine Control	22,646	2.6	0	$5,839	$6,430	$600	$5,830	1.0	22,805
Custom Measures		**465,603**	**0.0**	**875**	**$146,386**	**$720,800**	**$0**	**$720,800**	**4.9**	**571,309**
ECM 10	Retro-Commissioning Study	347,429	0.0	875	$115,916	$691,800	$0	$691,800	6.0	452,309
ECM 11	Replace Electric Water Heater with Heat Pump Water Heater	118,174	0.0	0	$30,470	$29,000	$0	$29,000	1.0	119,000
TOTALS		**1,675,709**	**244.3**	**722**	**$453,758**	**$1,515,790**	**$73,080**	**$1,442,710**	**3.2**	**1,771,906**

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

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

Cost Effective ECMs

4.1 Lighting

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Upgrades		**693,758**	**121.8**	**-145**	**$174,499**	**$208,580**	**$34,320**	**$174,260**	**1.0**	**681,624**
ECM 1	Retrofit Fixtures with LED Lamps	693,758	121.8	-145	$174,499	$208,580	$34,320	$174,260	1.0	681,624

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

ECM 1: Retrofit Fixtures with LED Lamps

Replace fluorescent, HID, or incandescent lamps with LED lamps. Many LED tubes are direct replacements for existing fluorescent tubes and can be installed while leaving the fluorescent fixture ballast in place. LED lamps can be used in existing fixtures as a direct replacement for most other lighting technologies. Be sure to specify replacement lamps that are compatible with existing dimming controls, where applicable. In some circumstances, you may need to upgrade your dimming system for optimum performance.

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

Affected Building Areas: all areas with fluorescent fixtures with T8 tubes, incandescent screw-in lights, and CFL fixtures

4.2 Lighting Controls

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Lighting Control Measures		**40,309**	**8.7**	**-8**	**$10,139**	**$38,130**	**$4,610**	**$33,520**	**3.3**	**39,604**
ECM 2	Install Occupancy Sensor Lighting Controls	40,309	8.7	-8	$10,139	$38,130	$4,610	$33,520	3.3	39,604

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

ECM 2: Install Occupancy Sensor Lighting Controls

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

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

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

This measure provides energy savings by reducing the lighting operating hours. Even with the existing scheduling control, further savings could be realized when spaces are vacant during normal occupied hours.

Affected Building Areas: offices, conference rooms, mechanical rooms, electrical rooms, server room, and storage rooms

4.3 Variable Frequency Drives (VFD)

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Variable Frequency Drive (VFD) Measures		**447,250**	**111.3**	**0**	**$115,311**	**$540,500**	**$33,100**	**$507,400**	**4.4**	**450,377**
ECM 3	Install VFDs on Constant Volume (CV) Fans	413,073	108.0	0	$106,500	$517,900	$29,800	$488,100	4.6	415,961
ECM 4	Install VFDs on Water Supply Pump	34,177	3.3	0	$8,812	$22,600	$3,300	$19,300	2.2	34,416

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

ECM 3: Install VFDs on Constant Volume (CV) Fans

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

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

VAV system controls should not raise the supply air temperature at the expense of the fan power. A common mistake is to reset the supply air temperature to achieve chiller energy savings, which can lead to additional air flow requirements. Supply air temperature should be kept low (e.g., 55°F) until the minimum fan speed (typically about 50%) is met. At this point, it is efficient to raise the supply air temperature as the load decreases, but not such that additional air flow and thus fan energy is required.

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

Affected Air Handlers: AHU-1, AHU-2, McQuay AHUs, and pressurization fans; exhaust fans as noted in Appendix A

ECM 4: Install VFDs on Water Supply Pump

Install VFDs to control water supply pump(s). Since water supply systems become an open system whenever and end-use valve or fixture is opened, the VFD will need to be controlled to maintain sufficient pressure in the distribution system to deliver water to the furthest point in the system.

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

4.4 Unitary HVAC

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Unitary HVAC Measures		**2,217**	**1.5**	**0**	**$572**	**$14,800**	**$800**	**$14,000**	**24.5**	**2,232**
ECM 5	Install High Efficiency Air Conditioning Units	2,217	1.5	0	$572	$14,800	$800	$14,000	24.5	2,232

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

ECM 5: Install High Efficiency Air Conditioning Units

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

The unit serves multiple elevator rooms. Consider a variable refrigerant flow (VRF) system for the upgrade. A VRF system uses a direct expansion (DX) heat pump to transport heat and/or cooling between an outdoor condensing unit and a network of indoor evaporators through refrigerant piping.

Affected Units: York D2CE10 unit

4.5 Electric Chillers

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Electric Chiller Replacement		**1,398**	**-2.1**	**0**	**$360**	**$44,300**	**$1,400**	**$42,900**	**119.0**	**1,408**
ECM 6	Install High Efficiency Chillers	1,398	-2.1	0	$360	$44,300	$1,400	$42,900	119.0	1,408

ECM 6: Install High Efficiency Chillers

We evaluated replacing the older inefficient electric chiller with a new high efficiency chiller. The type of chiller to be installed depends on the magnitude of the cooling load and variability of the cooling load profile, for example:

- Positive displacement chillers are usually under 600 tons of cooling capacity, and centrifugal chillers generally start at 150 tons of cooling capacity.
- Constant speed chillers should be used to meet cooling loads with little or no variation, while variable speed chillers are more efficient for variable cooling load profiles.
- Water cooled chillers are more efficient than air cooled chillers but require cooling towers and additional pumps to circulate the cooling water.
- In any given size range, variable speed chillers tend to have better partial load efficiency, but worse full load efficiency, than constant speed chillers.

Energy savings result from the improvement in chiller efficiency and matching the right type of chiller to the cooling load. The energy savings are calculated based on the cooling capacity of the new chiller, the improvement in efficiency compared with the base case equipment, the cooling load profile, and the estimated annual operating hours of the chiller before and after the upgrade.

For the purposes of this analysis, we evaluated the replacement of chillers on a one-for-one basis with equipment of the same capacity. We recommend that you work with your design team to select chillers that are sized appropriately for the cooling load. In some cases, the plant energy use can be reduced by selecting multiple chillers that match the facility load profile, rather than one or two large chillers. This can also improve the chiller plant reliability through increased redundancy. Energy savings are maximized by proper selection of new equipment based on the cooling load profile.

Replacing the chiller has a long payback based on energy savings and may not be justifiable based simply on energy considerations. However, the chiller has reached the end of its normal useful life. Typically, the marginal cost of purchasing a high-efficiency chiller can be justified by the marginal savings from the improved efficiency. When the chiller is eventually replaced, consider purchasing equipment that exceed the minimum efficiency required by building codes.

4.6 HVAC Improvements

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
HVAC System Improvements		**5,588**	**0.0**	**0**	**$1,441**	**$660**	**$120**	**$540**	**0.4**	**5,627**
ECM 7	Install Pipe Insulation	5,588	0.0	0	$1,441	$660	$120	$540	0.4	5,627

ECM 7: Install Pipe Insulation

Install insulation on domestic hot water system piping. Distribution system thermal losses are dependent on system fluid temperature, the size of the distribution system, and the extent and condition of piping insulation. When the insulation has been damaged due to exposure to water, when the insulation has been removed from some areas of the pipe, or when valves have not been properly insulated, system thermal efficiency can be significantly reduced. This measure saves energy by reducing heat transfer in the distribution system.

Affected Systems: domestic hot water piping connected to the electric storage tank water heaters in the Mezzanine fan, both 2nd floor fan, both 5th floor fan, and eastern 8th floor fan rooms

4.7 Domestic Water Heating

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Domestic Water Heating Upgrade		**556**	**0.0**	**0**	**$143**	**$690**	**$330**	**$360**	**2.5**	**560**
ECM 8	Install Low-Flow DHW Devices	556	0.0	0	$143	$690	$330	$360	2.5	560

ECM 8: Install Low-Flow DHW Devices

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

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

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

4.8 Food Service and Refrigeration Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Food Service & Refrigeration Measures		**22,646**	**2.6**	**0**	**$5,839**	**$6,430**	**$600**	**$5,830**	**1.0**	**22,805**
ECM 9	Vending Machine Control	22,646	2.6	0	$5,839	$6,430	$600	$5,830	1.0	22,805

ECM 9: Vending Machine Control

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

4.9 Custom Measures

#	Energy Conservation Measure	Annual Electric Savings (kWh)	Peak Demand Savings (kW)	Annual Fuel Savings (MMBtu)	Annual Energy Cost Savings ($)	Estimated M&L Cost ($)	Estimated Incentive ($)*	Estimated Net M&L Cost ($)	Simple Payback Period (yrs)**	CO_2e Emissions Reduction (lbs)
Custom Measures		**465,603**	**0.0**	**875**	**$146,386**	**$720,800**	**$0**	**$720,800**	**4.9**	**571,309**
ECM 10	Retro-Commissioning Study	347,429	0.0	875	$115,916	$691,800	$0	$691,800	6.0	452,309
ECM 11	Replace Electric Water Heater with Heat Pump Water Heater	118,174	0.0	0	$30,470	$29,000	$0	$29,000	1.0	119,000

ECM 10: Retro-Commissioning Study

Due to the complexity of today's HVAC systems and controls a thorough analysis and rebalance of heating, ventilation, and cooling systems should periodically be conducted. There are indications at this site that systems may not be operating correctly or as efficiently as they could be. One important tool available to building operators to ensure proper system operation is retro-commissioning.

Retro-commissioning is a common practice recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) to be implemented every few years. We recommend that you contact a reputable engineering firm that specializes in energy control systems and retro-commissioning. Ask them to propose a scope of work and an outline of the procedures and processes to be implemented, including a schedule and the roles of all responsible parties.

Once goals and responsibilities are established, the objective of the investigation process is to understand how the building is currently operating, identify the issues, and determine the most cost-effective way to improve performance. The retro-commissioning agent will review building documentation, interview building occupants, and inspect and test the equipment. Information is then compiled into a report and shared with facility staff, who will select which recommendations to implement after reviewing the findings.

The implementation phase puts the selected processes into place. Typical measures may include sensor calibration, equipment schedule changes, damper linkage repair and similar relatively low-cost adjustments—although more expensive sophisticated programming and building control system upgrades may be warranted. Approved measures may be implemented by the agent, the building staff, or by subcontractors. Typically, a combination of these individuals makes up the retro-commissioning team.

After the approved measures are implemented, the team will verify that the changes are working as expected. Baseline and post-case measurements will allow building staff to monitor equipment and ensure that the benefits are maintained.

A high-level evaluation of potential savings and costs is provided for demonstration purposes only. It is a screening evaluation for the potential in HVAC control improvements. Based on industry standards and previous project experience, the potential energy savings may be up to 15% of existing HVAC energy use. We estimate the cost of retro-commissioning studies and control improvements of $1.50 per square foot. Actual savings and costs will need to be outlined by the specific contractor engaged to perform the study. For the purposes of this report, we have conservatively estimated savings to be 6.3% of the HVAC energy consumption baseline.

ECM 11: Replace Electric Water Heater with Heat Pump Water Heater

We evaluated replacing the existing electric water heaters with heat pump water heaters (HPWH).

A typical electric water heater uses electric resistance coils to heat water at a coefficient of performance (COP) of 1. Air source heat pump water heaters use a refrigeration cycle to transfer heat from the surrounding air to the domestic water. The typical average COP for a HPWH is about 2.5, so they require significantly less electricity to produce the same amount of hot water as a traditional electric water heater. There are two types of HPWH, those integrated with the heat pump and storage tank in the same unit, and those that are split into two sections (with the storage tank separate from the heat pump). The following addresses integrated HPWH.

HPWH reject cold air. As such, they need to be installed in an unconditioned space of about 750 cubic feet with good ventilation. Ideal locations are garages, large enclosed, unconditioned storage areas, or areas with excess heat such as a furnace or boiler room.[6] The HPWH will also produce condensate so accommodations for draining the condensate need to be provided.

Most HPWH operate effectively down to an air temperature of 40 °F. Below that temperature, an electric resistance booster heater is typically required to achieve full heating capacity. It is critical that the HPWH controls are set up so that the electric resistance heat only engages when the air temperature is too cold for the HPWH to extract heat from it. HPWHs have a slow recovery. During periods of high demand, the electric resistance heating element, if enabled, may be energized to maintain set point, thus reducing the overall efficiency of the unit. It is recommended that a careful analysis of the hot water demand be conducted to determine if the application makes economic sense, and the HPWH heating capacity and storage are properly sized.

HPWH operate most effectively when the temperature difference between the incoming and outgoing water is high. Generally, this means that cold make-up water should be piped to the bottom of the tank and return water should be piped to the top of the tank to maintain stratification within the storage tank. Water should be drawn from the bottom of the tank to be heated. If there is a DHW recirculation pump, it should only be operated during high hot water demand periods.

Affected Units: All electric storage tank water heaters.

4.10 Measures for Future Consideration

There are additional opportunities for improvement that State of New Jersey may wish to consider. These potential upgrades typically require further analysis, involve substantial capital investment, and/or include significant system reconfiguration. These measure(s) are therefore beyond the scope of this energy audit. These measure(s) are described here to support a whole building approach to energy efficiency and sustainability.

State of New Jersey may wish to consider the Energy Savings Improvement Program (ESIP) or other whole building approach. With interest in implementing comprehensive, largescale and/or complex system wide projects, these measures may be pursued during development of a future energy savings plan. We recommend that you work with your energy service company (ESCO) and/or design team to:

[6] https://basc.pnnl.gov/code-compliance/heat-pump-water-heaters-code-compliance-brief#:~:text=HPWH%20must%20have%20unrestricted%20airflow,depending%20on%20size%20of%20system

- Evaluate these measures further.
- Develop firm costs.
- Determine measure savings.
- Prepare detailed implementation plans.

Other modernization or capital improvement funds may be leveraged for these types of refurbishments. As you plan for capital upgrades, be sure to consider the energy impact of the building systems and controls being specified.

Upgrade to a Heat Pump System

Electric resistance heating units work by passing an electric current through wires to heat them. The system is 100% efficient since for every unit of electricity consumed, one unit of heat is produced.

But there is a way to convert electricity to create heat at better than a 1:1 ratio. Heat pumps operate on a more efficient principle, the refrigeration cycle. Instead of directly converting electricity to heat, electricity does the work, via a compressor, of moving refrigerant through a system that transfers heat from a cooler place to a warmer place. That system can move three to five as much energy as is available using electric resistance heating methods. Heat pumps work in a similar manner to an air conditioner, except they reverse the cooling process to circulate warm air instead of cold air. Also, heat pumps are generally capable of dispensing refrigerated air as they can typically be operated in air conditioning mode.

Electric resistance heat, including electric furnaces and baseboard heaters, can be inexpensive to install but often expensive to run. Facilities with these systems can save substantial energy at a moderate cost by installing a heat pump when they replace a central air conditioner.

Even in buildings without central air-conditioning, there are opportunities to save energy when an existing electric furnace needs to be replaced, as well as opportunities to install ductless electric heat pumps in buildings with baseboard electric heaters and electric fan coils. Unit ventilators with built-in electric resistance heaters can be replaced with unit ventilators with integrated heat pumps.

Electric heat pumps have high coefficient of performance (COP) ratings and are substantially more efficient than traditional electric heating systems. Further investigation is required to determine whether installing a heat pump system is a cost-effective solution when replacing existing electrical heating systems.

5 Energy Efficient Best Practices

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

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

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

Energy Tracking with ENERGY STAR Portfolio Manager

You've heard it before—you cannot manage what you do not measure. ENERGY STAR Portfolio Manager is an online tool that you can use to measure and track energy and water consumption, as well as greenhouse gas emissions[7] . Your account has already been established. Now you can continue to keep tabs on your energy performance every month.

Weatherization

Caulk or weather strip leaky doors and windows to reduce drafts and loss of heated or cooled air. Sealing cracks and openings can reduce heating and cooling costs, improve building durability, and create a healthier indoor environment. Materials used may include caulk, polyurethane foam, and other weather-stripping materials. There is an energy savings opportunity by reducing the uncontrolled air exchange between the outside and inside of the building. Blower door assisted comprehensive building air sealing will reduce the amount of air exchange, which will in turn reduce the load on the buildings heating and cooling equipment, providing energy savings and increased occupant comfort.

Doors and Windows

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

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

Lighting Maintenance

Clean lamps, reflectors and lenses of dirt, dust, oil, and smoke buildup every six to twelve months. Light levels decrease over time due to lamp aging, lamp and ballast failure, and buildup of dirt and dust. Together, this can reduce total light output by up to 60% while still drawing full power.

In addition to routine cleaning, developing a maintenance schedule can ensure that maintenance is performed regularly, and it can reduce the overall cost of fixture re-lamping and re-ballasting. Group re-lamping and re-ballasting maintains lighting levels and minimizes the number of site visits by a lighting technician or contractor, decreasing the overall cost of maintenance.

Lighting Controls

As part of a lighting maintenance schedule, test lighting controls to ensure proper functioning. For occupancy sensors, this requires triggering the sensor and verifying that the sensor's timer settings are correct. For daylight and photocell sensors, maintenance involves cleaning sensor lenses and confirming that setpoints and sensitivity are configured properly. Adjust exterior lighting time clock controls seasonally as needed to match your lighting requirements.

Motor Controls

Electric motors often run unnecessarily, and this is an overlooked opportunity to save energy. These motors should be identified and turned off when appropriate. For example, exhaust fans often run unnecessarily when ventilation requirements are already met. Whenever possible, use automatic devices such as twist timers or occupancy sensors to turn off motors when they are not needed.

Motor Maintenance

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

Fans to Reduce Cooling Load

Install ceiling fans to supplement your cooling system. Thermostat settings can typically be increased by 4°F with no change in overall occupant comfort due to the wind chill effect of moving air.

Thermostat Schedules and Temperature Resets

Use thermostat setback temperatures and schedules to reduce heating and cooling energy use during periods of low or no occupancy. Thermostats should be programmed for a setback of 5-10°F during low occupancy hours (reduce heating setpoints and increase cooling setpoints). Cooling load can be reduced by increasing the facility's occupied setpoint temperature. In general, during the cooling season, thermostats should be set as high as possible without sacrificing occupant comfort.

Economizer Maintenance

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

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

AC System Evaporator/Condenser Coil Cleaning

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

HVAC Filter Cleaning and Replacement

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

Ductwork Maintenance

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

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

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

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

Label HVAC Equipment

For improved coordination in maintenance practices, we recommend labeling or re-labeling the site HVAC equipment. Maintain continuity in labeling by following labeling conventions as indicated in the facility drawings or BAS building equipment list. Use weatherproof or heatproof labeling or stickers for permanence, but do not cover over original equipment nameplates, which should be kept clean and readable whenever possible. Besides equipment, label piping for service and direction of flow when possible. Ideally, maintain a log of HVAC equipment, including nameplate information, asset tag designation, areas served, installation year, service dates, and other pertinent information.

This investment in your equipment will enhance collaboration and communication between your staff and your contracted service providers and may help you with regulatory compliance.

Optimize HVAC Equipment Schedules

Energy management systems (BAS) typically provide advanced controls for building HVAC systems, including chillers, boilers, air handling units, rooftop units and exhaust fans. The BAS monitors and reports operational status, schedules equipment start and stop times, locks out equipment operation based on outside air or space temperature, and often optimizes damper and valve operation based on complex algorithms. These BAS features, when in proper adjustment, can improve comfort for building occupants and save substantial energy.

Know your BAS scheduling capabilities. Regularly monitor HVAC equipment operating schedules and match them to building operating hours to eliminate unnecessary equipment operation and save energy. Monitoring should be performed often at sites with frequently changing usage patterns – daily in some cases. We recommend using the optimal start feature of the BAS (if available) to optimize the building warmup sequence. Most BAS scheduling programs provide for holiday schedules, which can be used during reduced use or shutdown periods. Finally, many systems are equipped with a one-time override function, which can be used to provide additional space conditioning due to a one-time, special event. When available this override feature should be used rather than changing the base operating schedule.

Water Heater Maintenance

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

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

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

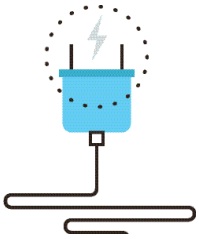
Compressed Air System Maintenance

Compressed air systems require periodic maintenance to operate at peak efficiency. A maintenance plan for compressed air systems should include:

- Inspection, cleaning, and replacement of inlet filter cartridges.
- Cleaning of drain traps.
- Daily inspection of lubricant levels to reduce unwanted friction.
- Inspection of belt condition and tension.
- Check for leaks and adjust loose connections.
- Overall system cleaning.
- Reduce pressure setting to minimum needed for air operated equipment.
- Turn off compressor if not routinely needed.
- Use low pressure blower air rather than high pressure compressed air.

Contact a qualified technician for help with setting up periodic maintenance schedule.

Plug Load Controls



Reducing plug loads is a common way to decrease your electrical use. Limiting the energy use of plug loads can include increasing occupant awareness, removing under-used equipment, installing hardware controls, and using software controls. Consider enabling the most aggressive power settings on existing devices or install load sensing or occupancy sensing (advanced) power strips[8]. Your local utility may offer incentives or rebates for this equipment.

Procurement Strategies

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

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

6 Water Best Practices

Getting Started

The commercial and institutional sector is the second largest consumer of publicly supplied water in the United States, accounting for 17% of the withdrawals from public water supplies[9]. In New Jersey, excluding water used for power generation, approximately 80% of total water use was attributed to potable supply during the period of 2009 to 2018. Water withdrawals for potable supply have not changed noticeably during the period from 1990 to 2018[10].

Water management planning serves as the foundation for any successful water reduction effort. It is the first step a commercial or institutional facility owner or manager should take to achieve and sustain long-term water savings. Understanding how water is used within a facility is critical for the water management planning process. A water assessment provides a comprehensive account of all known water uses at the facility. It allows the water management team to establish a baseline from which progress and program success can be measured. It also enables the water management team to set achievable goals and identify and prioritize specific projects based on the relative savings opportunities and project cost-effectiveness.

Water conservation devices may significantly reduce your water and sewer usage costs. Any reduction in water use reduces grid-level electricity use since a significant amount of electricity is used to treat and deliver water from reservoirs to end users.

For more information regarding water conservation or additional details regarding the practices shown below go to the EPA's WaterSense website[11] or download a copy of EPA's "WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities"[12] to get ideas for creating a water management plan and best practices for a wide range of water using systems.

Leak Detection and Repair

Identifying and repairing leaks and other water use anomalies within a facility's water distribution system or from processes or equipment can keep a facility from wasting significant quantities of water. Examples of common leaks include leaking toilets and faucets, drip irrigation malfunctions, stuck float valves, and broken distribution lines. Reading meters, installing failure abatement technologies, and conducting visual and auditory inspections are important best practices to detect leaks. Train building occupants, employees, and visitors to report any leaks that they detect. To reduce unnecessary water loss, detected leaks should be repaired quickly. Repairing leaks in water distribution that is pressurized by on-site pumps or in heated or chilled water piping will also reduce energy use.

[9] Estimated from analyzing data in: Solley, Wayne B,. et al, "Estimated Use of Water in the United States in 1995", U.S Geological Suvey Circular 1200, (1998)

[10] https://dep.nj.gov/wp-content/uploads/dsr/trends-water-supply.pdf

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

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

Toilets and Urinals

Toilets and urinals are considered sanitary fixtures and are found in most facilities. High efficiency fixtures are at least 20% more efficient than available standard products. Leaking or damaged equipment is a substantial source of water waste. Train users to report continuously flushing, leaking, or otherwise improperly operating equipment to the appropriate personnel. Depending on the age of the equipment and the frequency of use, it may be cost effective to replace older inefficient fixtures with current generation WaterSense labeled equipment.

Commercial facilities typically use tank toilets or wall-mount flushometers. Educate and inform users with restroom signage and other means to avoid flushing inappropriate objects. For tank toilets, periodically check to ensure fill valves are working properly and that water level is set correctly. Annually test toilets to ensure the flappers are not worn or allowing water to seep from the tank into the bowl and down the sewer. Control stops and piston valves on flushometer toilets should be checked at least annually.

Most urinals use water to flush liquid. These standard single-user fixtures are present in most facilities. Non-water urinals use a specially designed trap that allows liquid waste to drain out of the fixture through a trap seal, and into the drainage system. Flushing urinals should be inspected at least annually for proper valve and sensor operation. For non-water urinals, follow maintenance practices as directed by the manufacturer to ensure products perform as expected. Non-water urinals can be considered during urinal replacement, however, review the condition and design of the existing plumbing system and the expected usage patterns to ensure that these products will provide the anticipated performance.

Faucets and Showerheads

Faucets and showerheads are sanitary fixtures that generally dispense heated water. Reducing water use by these fixtures translates into a reduction of site fuel or electric use depending on how water is heated. High efficiency fixtures are at least 20% more efficient than available standard products. Leaking or damaged equipment is a substantial source of water waste. Train users to report continuously dripping, leaking, or otherwise improperly operating equipment to the appropriate personnel. Depending on the age of the equipment and the frequency of use, it may be cost effective to replace older fixtures with current generation WaterSense labeled equipment.

Faucets are used for a variety of purposes, and standard flow rates are dictated by the intended use. Public use lavatory faucets and kitchen faucets are subject to maximum flow rates while service sinks are not. Periodically inspect faucet aerators for scale buildup to ensure flow is not being restricted. Clean or replace the aerator or other spout end device as needed. Check and adjust automatic sensors (where installed) to ensure they are operating properly to avoid faucets running longer than necessary. Post materials in restrooms and kitchens to ensure user awareness of the facility's water-efficiency goals. Remind users to turn off the tap when they are done and to consider turning the tap off during sanitation activities when it is not being used. Consider installing lavatory and kitchen faucet fixtures with reduced flow. Federal standards limit kitchen and restroom faucet flows to 2.2 gpm. To qualify for a WaterSense label a faucet cannot exceed 1.5 gpm.

Effective in 1992, the maximum allowable flow rate for all showerheads sold in the United States is 2.5 gpm. Since this standard was enacted, many showerheads have been designed to use even less water. WaterSense labeled equipment is designed to use 2.0 gpm, or less. For optimum showerhead efficiency, the system pressure should be tested to make sure that it is between 20 and 80 pounds per square inch (psi). Verify that plumbing lines are routed through a shower valve to prevent water pressure fluctuations. Periodically inspect showerheads for scale buildup to ensure flow is not being restricted. In general, replace showerheads with 2.5 gpm flow rates or higher with WaterSense labeled models.

Note: Use of poor performing replacement reduced flow showerheads may result in increased use if the duration of use is increased to compensate for reduced performance. WaterSense labeled showerheads are independently certified to meet or exceed minimum performance requirements for spray coverage and force.

7 On-Site Generation

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

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

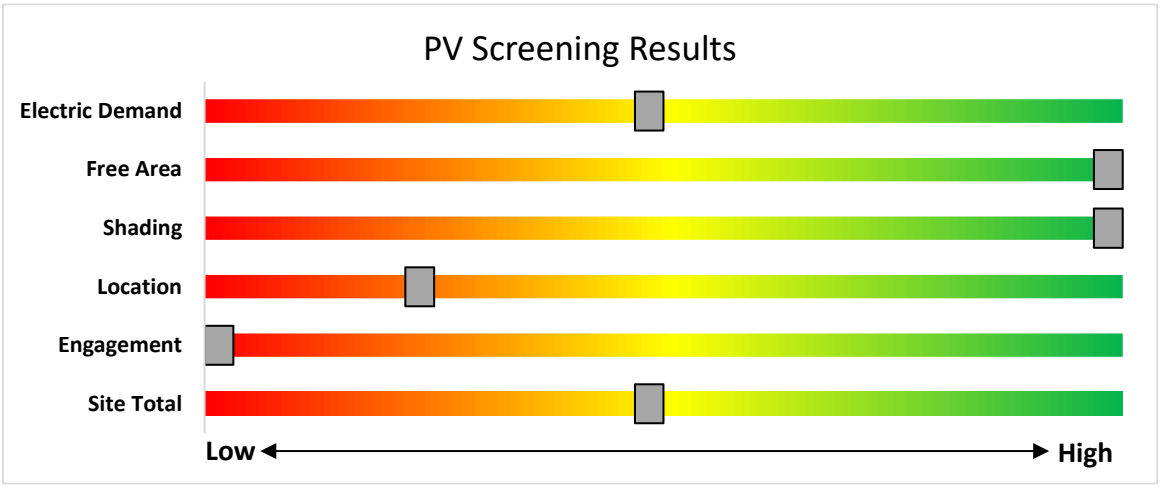
7.1 Solar Photovoltaic

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

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

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

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



Potential	Medium	
System Potential	268	kW DC STC
Electric Generation	319,287	kWh/yr
Displaced Cost	$82,320	/yr
Installed Cost	$905,800	

Photovoltaic Screening

Successor Solar Incentive Program (SuSI)

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

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

- **Successor Solar Incentive Program (SuSI):** https://www.njcleanenergy.com/renewable-energy/programs/susi-program
- **Basic Info on Solar PV in NJ**: http://www.njcleanenergy.com/whysolar
- **NJ Solar Market FAQs**: ww.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

7.2 Combined Heat and Power

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

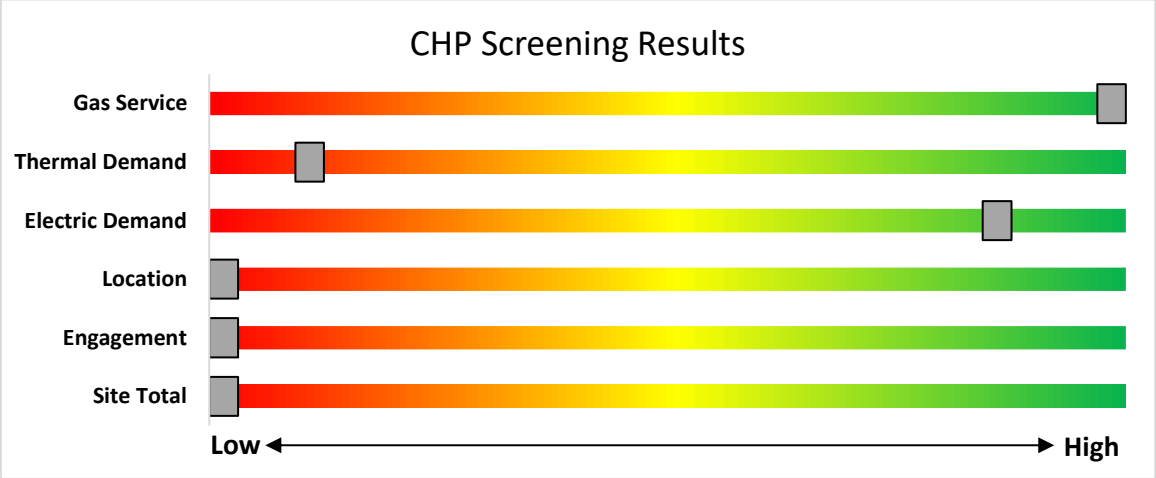
CHP systems typically produce a portion of the electric power used on-site, with the balance of electric power needs supplied by the local utility company. The heat is used to supplement (or replace) existing boilers and provide space heating and/or domestic hot water heating. Waste heat can also be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

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

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

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

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



Combined Heat and Power Screening

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

8 Electric Vehicles

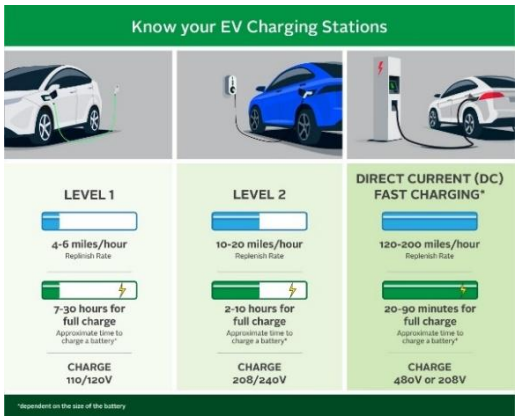
All electric vehicles (EVs) have an electric motor instead of an internal combustion engine. EVs function by plugging into a charge point, taking electricity from the grid, and then storing it in rechargeable batteries. Although electricity production may contribute to air pollution, the U.S. EPA categorizes all-electric vehicles as zero-emission vehicles because they produce no direct exhaust or tailpipe emissions.

EVs are typically more expensive than similar conventional and hybrid vehicles, although some cost can be recovered through fuel savings, federal tax credit, or state incentives

8.1 EV Charging

EV charging stations provide a means for electric vehicle operators to recharge their batteries at a facility. While many EV drivers charge at home, others do not have access to regular home charging, and the ability to charge at work or in public locations is critical to making EVs practical for more drivers. Charging can also be used for electric fleet vehicles, which can reduce fuel and maintenance costs for fleets that replace gas or diesel vehicles with EVs.

EV charging comes in three main types. For this assessment, the screening considers addition of Level 2 charging, which is most common at workplaces and other public locations. Depending on the site type and usage, other levels of charging power may be more appropriate.



The preliminary assessment of EV charging at the facility shows that there is high potential for adding EV chargers to the facility's parking, based on potential costs of installation and other site factors.

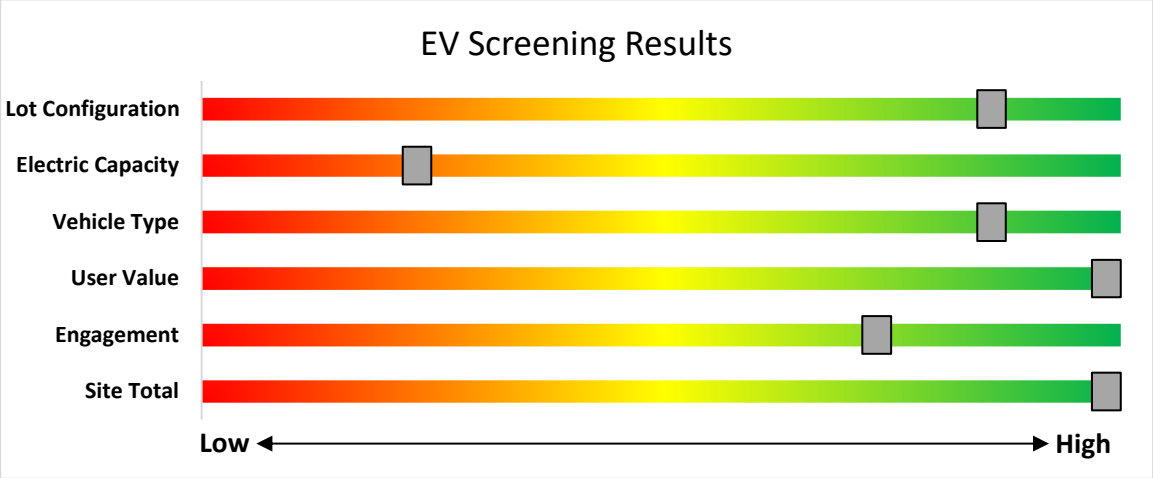
The primary costs associated with installing EV charging are the charger hardware and the cost to extend power from the facility to parking spaces. This may include upgrades to electric panels to serve increased loads.

The type and size of the parking area impact the costs and feasibility of adding EV charging. Parking structure installations can be less costly than surface lot installations as power may be readily available, and equipment and wiring can be surface mounted. Parking lot installations often require trenching through concrete or asphalt surface. Large parking areas provide greater flexibility in charger siting than smaller lots.

The location and capacity of facility electric panels also impact charger installation costs. A Level 2 charger generally requires a dedicated 208-240V, 40 Amp circuit. The electric panel nearest the planned installation may not have available capacity and may need to be upgraded to serve new EV charging loads. Alternatively, chargers could be powered from a more distant panel. The distance from the panel to the location of charging stations ties directly to costs, as conduits, cables, and potential trenching costs all increase on a per-foot basis. The more charging stations planned, the more likely it is that additional electrical capacity will be needed.

Other factors to consider when planning for EV charging at a facility include who the intended users are, how long they park vehicles at the site, and whether they will need to pay for the electricity they use.

The graphic below displays the results of the EV charging assessment conducted as part of this audit. The position of each slider indicates the impact each factor has on the feasibility of installing EV charging at the site.



EV Charger Screening

Electric Vehicle Programs Available

New Jersey is leading the way on electric vehicle (EV) adoption on the East Coast. There are several programs designed to encourage EV adoption in New Jersey, which is crucial to reaching a 100% clean energy future.

NJCEP offers a variety of EV programs for vehicles, charging stations, and fleets. Certain EV charging stations that receive electric utility service from Atlantic City Electric Company (ACE), Public Service Electric and Gas Company (PSE&G) or Jersey Central Power and Light (JCP&L), may be eligible for additional electric vehicle charging incentives directly from the utility. Projects may be eligible for both the incentives offered by this BPU program and incentives offered by ACE, PSE&G or JCP&L, up to 90% of the combined charger purchase and installation costs. Please check ACE, PSE&G or JCP&L program eligibility requirements before purchasing EV charging equipment, as additional conditions on types of eligible chargers may apply for utility incentives.

EV Charging incentive information is available from Atlantic City Electric, PSE&G and JCP&L.For more information and to keep up to date on all EV programs please visit https://www.njcleanenergy.com/commercial-industrial/programs/electric-vehicle-programs

9 PROJECT FUNDING AND INCENTIVES

Ready to improve your building's performance? New Jersey's Clean Energy Programs and Utility Energy Efficiency Programs can help. Pick the program that works best for you. This section provides an overview of currently available incentive programs in New Jersey.

NJBPU and NJCEP Administered Programs

- New Construction (residential, commercial, industrial, government)
- Large Energy Users
- Energy Savings Improvement Program (financing)
- State Facilities Initiative*
- Local Government Energy Audits
- Combined Heat & Power & Fuel Cells

*State facilities are also eligible for utility programs

Utility Administered Programs

- Existing buildings (residential, commercial, industrial, government)
- Efficient Products
  - Lighting & Marketplace
  - HVAC
  - Appliance Rebates
  - Appliance Recycling

9.1 New Jersey's Clean Energy Program

Save money while saving the planet! New Jersey's Clean Energy Program is a statewide program that offers incentives, programs, and services that benefit New Jersey residents, businesses, educational, non-profit, and government entities to help them save energy, money, and the environment.

Large Energy Users

The Large Energy Users Program (LEUP) is designed to foster self-directed investment in energy projects. This program is offered to New Jersey's largest energy customers. To qualify entities must have incurred at least $5 million in total energy costs in the prior fiscal year.

Incentives

Incentives are based on the specifications below. The maximum incentive per entity is the lesser of:

- $4 million
- 75% of the total project(s) cost
- 90% of total NJCEP fund contribution in previous year
- $0.33 per projected kWh saved; $3.75 per projected Therm saved annually

How to Participate

To participate in LEUP, you will first need submit an enrollment application. This program requires all qualified and approved applicants to submit an energy plan that outlines the proposed energy efficiency work for review and approval. Applicants may submit a Draft Energy Efficiency Plan (DEEP), or a Final Energy Efficiency Plan (FEEP). Once the FEEP is approved, the proposed work can begin.

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

Combined Heat and Power

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

Incentives[13]

Eligible Technology	Size (Installed Rated Capacity)	Incentive ($/Watt)[5]	% of Total Cost Cap per Project	$ Cap per Project
CHPs powered by non-renewable or renewable fuel source, or a combination:[4] - Gas Internal Combustion Engine - Gas Combustion Turbine - Microturbine Fuel Cells ≥60%	≤500 kW[1]	$2.00	30-40%[2]	$2 million
	>500 kW - 1 MW[1]	$1.00		
	> 1 MW - 3 MW[1]	$0.55	30%	$3 million
	>3 MW[1]	$0.35		
Fuel Cells ≥40%	Same as above[1]	Applicable amount above	30%	$1 million
Waste Heat to Power (WHP)[3] Powered by non-renewable fuel source. Heat recovery or other mechanical recovery from existing equipment utilizing new electric generation equipment (e.g. steam turbine)	≤1MW[1]	$1.00	30%	$2 million
	> 1MW[1]	$.50	30%	$3 million

[13]

[1] Incentives are tiered, which means the incentive levels vary based upon the installed rated capacity, as listed in the chart above. For example, a 4 MW CHP system would receive $2.00/watt for the first 500 kW, $1.00/watt for the second 500 kW, $0.55/watt for the next 2 MW and $0.35/watt for the last 1 MW (up to the caps listed).

[2] The maximum incentive will be limited to 30% of total project. For CHP projects up to 1 MW, this cap will be increased to 40% where a cooling application is used or included with the CHP system (e.g. absorption chiller).

[3] Projects will be eligible for incentives shown above, not to exceed the lesser of % of total project cost per project cap or maximum $ per project cap. Projects installing CHP or FC with WHP will be eligible for incentive shown above, not to exceed the lesser caps of the CHP or FC incentive. Minimum efficiency will be calculated based on annual total electricity generated, utilized waste heat at the host site (i.e. not lost/rejected), and energy input.

[4] Systems fueled by a Class 1 Renewable Fuel Source, as defined by N.J.A.C. 14:8-2.5, are eligible for a 30% incentive bonus. If the fuel is mixed, the bonus will be prorated accordingly. For example, if the mix is 60/40 (60% being a Class 1 renewable), the bonus will be 18%. This bonus will be included in the final performance incentive payment, based on system performance and fuel mix consumption data. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

[5] CHP-FC systems located at Critical Facility and incorporating blackstart and islanding technology are eligible for a 25% incentive bonus. This bonus incentive will be paid with the second/Installation incentive payment. Total incentive, inclusive of bonus, shall not exceed above stipulated caps.

How to Participate

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

Successor Solar Incentive Program (SuSI)

The SuSI program replaces the SREC Registration Program (SRP) and the Transition Incentive (TI) program. The program is used to register and certify solar projects in New Jersey. Rebates are not available for solar projects, but owners of solar projects must register their projects prior to the start of construction to establish the project's eligibility to earn SREC-IIs (Solar Renewable Energy Certificates-II). SuSI consists of two sub-programs. The Administratively Determined Incentive (ADI) Program and the Competitive Solar Incentive (CSI) Program.

Administratively Determined Incentive (ADI) Program

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

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

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

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

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

The ADI Program online portal is now open to new registrations.

Competitive Solar Incentive (CSI) Program

The CSI Program opened on April 15, 2023, and will serve as the permanent program within the SuSI Program providing incentives to larger solar facilities. The CSI Program is open to qualifying grid supply solar facilities, non-residential net metered solar installations with a capacity greater than five (5) megawatts ("MW"), and to eligible grid supply solar facilities installed in combination with energy storage.

CSI eligible facilities will only be allowed to register in the CSI program upon award of a bid pursuant to N.J.A.C. 14:8-11.10.

The CSI program structure has separate categories, or tranches, to ensure that a range of solar project types, including those on preferred sites, are able to participate despite potentially different project cost profiles. The Board has approved four tranches for grid supply and large net metered solar and an additional fifth tranche for storage in combination with grid supply solar. The following table lists procurement targets for the first solicitation:

Tranche	Project Type	MW (dc) Targets
Tranche 1.	Basic Grid Supply	140
Tranche 2.	Grid Supply on the Built Environment	80
Tranche 3.	Grid Supply on Contaminated Sites and Landfills	40
Tranche 4.	Net Metered Non- Residential	40
Tranche 5.	*Storage Paired with Grid	160 MWh

*The storage tranche of 160 MWh corresponds to a 4-hour storage pairing of 40 MW of solar

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

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

Energy Savings Improvement Program

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

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

How to Participate

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

(1) Use an energy services company or "ESCO."
(2) Use independent engineers and other specialists, or your own qualified staff, to provide and manage the requirements of the program through bonds or lease obligations.
(3) Use a hybrid approach of the two options described above where the ESCO is used for some services and independent engineers, or other specialists or qualified staff, are used to deliver other requirements of the program.

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

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

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

Demand Response (DR) Energy Aggregator

Demand Response Energy Aggregator is a program designed to reduce the electric load when electric wholesale prices are high or when the reliability of the electric grid is threatened due to peak demand. Grid operators call upon curtailment service providers and commercial facilities to reduce electric usage during times of peak demand, making the grid more reliable and reducing transmission costs 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 its electric usage.

Typically, an electric customer must 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 greater capability to quickly curtail their demand during peak hours receive higher payments. Customers with back-up generators on site 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 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 setpoints 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, 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 DR 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 the website of the independent system operator, PJM, and it includes contact information for each company, as well as the states where they have active business[14]. PJM also posts training materials for program members interested in specific rules and requirements regarding DR activity along with a variety of other DR program information[15].

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 they may also install controls or remote monitoring equipment of their own to help ensure compliance with all terms and conditions of a DR contract.

[14] http://www.pjm.com/markets-and-operations/demand-response.aspx.

[15] http://www.pjm.com/training/training-events.aspx.

9.2 Utility Energy Efficiency Programs

The Clean Energy Act, signed into law by Governor Murphy in 2018, requires New Jersey's investor-owned gas and electric utilities to reduce their customers' use by set percentages over time. To help reach these targets the New Jersey Board of Public Utilities approved a comprehensive suite of energy efficiency programs to be run by the utility companies.

Prescriptive and Custom

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

Equipment Examples

Lighting
Lighting Controls
HVAC Equipment
Refrigeration
Gas Heating
Gas Cooling
Commercial Kitchen Equipment
Food Service Equipment
Variable Frequency Drives
Electronically Commutate Motors
Variable Frequency Drives
Plug Loads Controls
Washers and Dryers
Agricultural
Water Heating

The Prescriptive program provides fixed incentives for specific energy efficiency measures. Prescriptive incentives vary by equipment type. The Custom program provides incentives for more unique or specialized technologies or systems that are not addressed through prescriptive incentives.

Direct Install

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

Incentives

The program pays up to 70% of the total installed cost of eligible measures.

How to Participate

To participate in Direct Install, you will work with a participating contractor. The contractor will be paid the measure incentives directly by the program, which will pass on to you in the form of reduced material and implementation costs. This means up to 70% of eligible costs are covered by the Direct Install program, subject to program rules and eligibility, while the remaining percent of the cost is paid to the contractor by the customer.

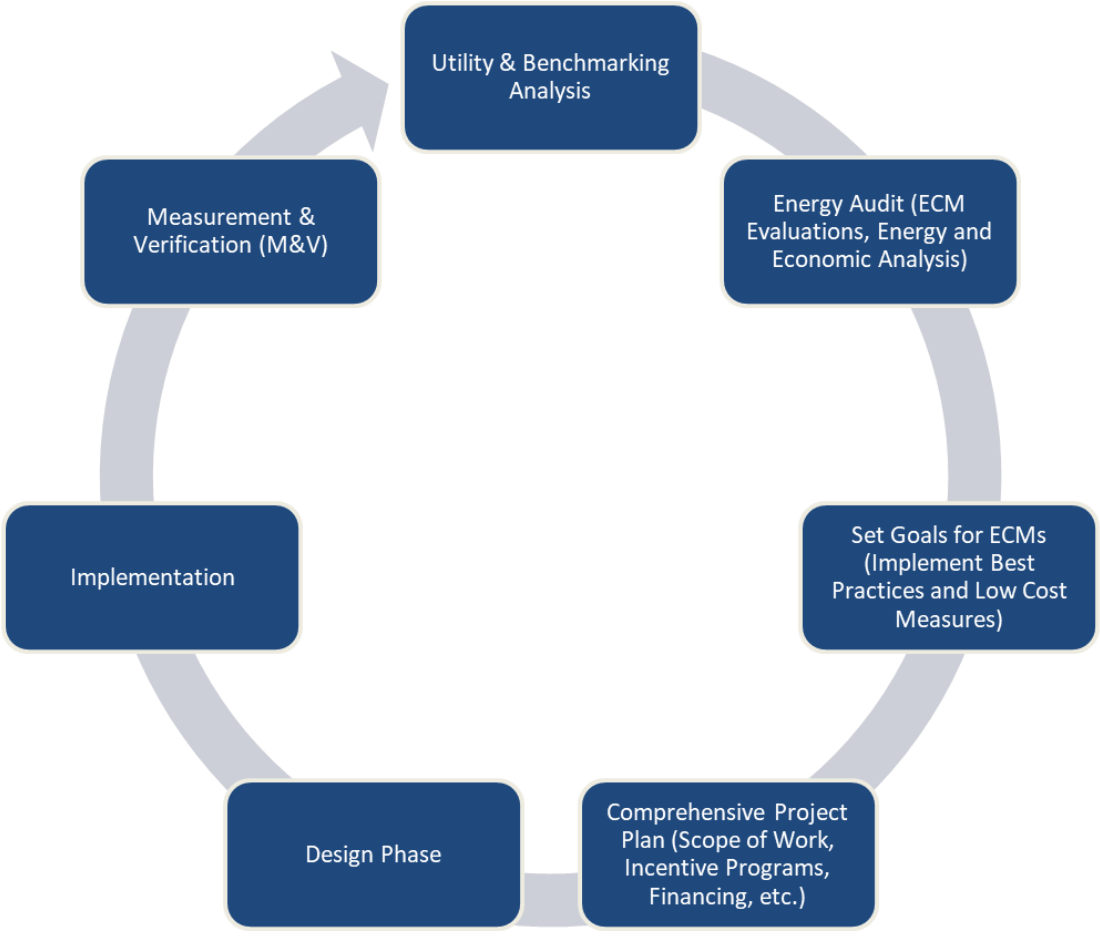
Engineered Solutions

The Engineered Solutions Program provides tailored energy-efficiency assistance and services to municipalities, universities, schools, hospitals, and healthcare facilities (MUSH), non-profit entities, and multifamily buildings. Customers receive expert guided services, including investment-grade energy auditing, engineering design, installation assistance, construction administration, commissioning, and measurement and verification (M&V) services to support the implementation of cost-effective and comprehensive efficiency projects. Engineered Solutions is generally a good option for medium to large sized facilities with a peak demand over 200 kW looking to implement as many measures as possible under a single project to achieve deep energy savings. Engineered Solutions has an added benefit of addressing measures that may not qualify for other programs. Many facilities pursuing an Energy Savings Improvement Program loan also use this program. Incentives for this program are based on project scope and energy savings achieved.

For more information on any of these programs, contact your local utility provider or visit https://www.njcleanenergy.com/transition.

10 Project Development

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



Project Development Cycle

11 Energy Purchasing and Procurement Strategies

11.1 Retail Electric Supply Options

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

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

A list of licensed third-party electric suppliers is available at the NJBPU website[16].

11.2 Retail Natural Gas Supply Options

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

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

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

A list of licensed third-party natural gas suppliers is available at the NJBPU website[17].

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

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

APPENDIX A: EQUIPMENT INVENTORY & RECOMMENDATIONS

Lighting Inventory & Recommendations

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Corridor - West 1st	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - West 1st	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	26	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	0.8	5,167	-1	$1,300	$1,310	$260	0.8
MB-Corridor - West 1st	26	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor		62	3,835	1	Relamp	No	26	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.8	3,619	-1	$910	$1,310	$260	1.2
MB-Dining Area - Mail Break Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Dining Area - Mezzanine Pantry	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East Mailroom Telecom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - Electrical Supply	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
MB-Electrical Room - High Voltage	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.6	2,956	-1	$744	$1,470	$230	1.7
MB-Electrical Room - Mezzanine	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,000	0.0	145	0	$37	$50	$10	1.1
MB-Electrical Room - Retail Electric Meters	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	554	0	$139	$480	$70	2.9
MB-Electrical Room - West 1st Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Elevator - Garage Elevator Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Garage - Main Building Rear Garages	14	LED - Fixtures: Ambient 1x4 Fixture	Wall Switch	S	25	4,000	2	None	Yes	14	LED - Fixtures: Ambient 1x4 Fixture	Occupancy Sensor	25	2,760	0.1	477	0	$120	$330	$40	2.4
MB-Lobby - Main	26	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	26	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,409	0	$354	$1,640	$100	4.3
MB-Lobby - Main	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Lobby - Main	34	Incandescent: (1) 60W A19 Screw-In Lamp	Other	S	60	5,475	1	Relamp	No	34	LED Lamps: A19 Lamps	Other	9	5,475	1.6	10,443	-2	$2,627	$860	$30	0.3
MB-Lobby - Main	12	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	12	LED Lamps: Biax LED Lamps	Other	56	5,475	0.3	1,734	0	$436	$460	$0	1.1
MB-Lobby - Rear	59	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	59	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.5	3,198	-1	$804	$3,730	$240	4.3
MB-Lobby - Rear	6	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	6	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Lobby - Rear	20	Incandescent: (1) 60W A19 Screw-In Lamp	Other	S	60	5,475	1	Relamp	No	20	LED Lamps: A19 Lamps	Other	9	5,475	1.0	6,143	-1	$1,545	$510	$20	0.3
MB-Lobby - Rear	64	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	64	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	2.0	12,720	-3	$3,199	$3,240	$640	0.8
MB-Lobby - Rear	27	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	27	LED Lamps: Biax LED Lamps	Other	56	5,475	0.6	3,903	-1	$982	$1,020	$0	1.0
MB-Mechanical - Fan Room Mezzanine	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.0	139	0	$35	$50	$10	1.1
MB-Mechanical - Fan Room Mezzanine	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - Fan Room Mezzanine East Mailroom	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Mechanical - Fire Pump Room	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.3	1,293	0	$325	$680	$110	1.8
MB-Mechanical - Garage Exhaust Fan Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - Generator Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.5	2,217	0	$558	$940	$160	1.4
MB-Mechanical - Pump Room	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.5	2,217	0	$558	$940	$160	1.4
MB-Mechanical - West 1st Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - Fire Control Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
MB-Office - Maintenance	12	Linear Fluorescent - T8: 4' T8 (32W) - 3L	Wall Switch	S	93	4,000	1, 2	Relamp	Yes	12	LED - Linear Tubes: (3) 4' Lamps	Occupancy Sensor	44	2,760	0.7	3,326	-1	$836	$1,090	$220	1.0
MB-Office - Maintenance	2	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	2	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.1	364	0	$92	$230	$20	2.3
MB-Office - Mezzanine Offices	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,000	0.0	145	0	$37	$50	$10	1.1
MB-Office - Mezzanine Offices	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	554	0	$139	$480	$70	2.9
MB-Office - Mezzanine Offices	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - Mezzanine Offices	13	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	13	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.5	2,366	0	$595	$820	$40	1.3
MB-Office - Mezzanine Offices	12	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	12	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.5	2,184	0	$549	$790	$40	1.4
MB-Office - Mezzanine Room B	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.8	3,695	-1	$929	$1,670	$270	1.5
MB-Office - Mezzanine Room B	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
MB-Office - Mezzanine Room C	11	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	11	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.4	2,032	0	$511	$890	$150	1.4
MB-Office - Mezzanine Room C	5	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	5	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	924	0	$232	$580	$90	2.1
MB-Office - Property Managers Office	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - Property Managers Office	2	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	2	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.1	364	0	$92	$230	$20	2.3
MB-Office - Property Managers Office	8	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.3	1,456	0	$366	$630	$40	1.6
MB-Office - West 1st	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	0.5	3,180	-1	$800	$810	$160	0.8
MB-Office - West 1st	1	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Wall Switch	56	4,000	0.0	106	0	$27	$40	$0	1.5
MB-Restroom - East Mailroom Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East Mailroom Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East Mailroom Women's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Restroom - East Mailroom Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - Female Mezzanine	5	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	5	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	506	0	$127	$190	$0	1.5
MB-Restroom - Female Mezzanine Handicap	1	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.0	101	0	$25	$40	$0	1.6
MB-Restroom - Male Mezzanine	5	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	5	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	506	0	$127	$190	$0	1.5
MB-Restroom - Male Mezzanine Handicap	1	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.0	101	0	$25	$40	$0	1.6
MB-Restroom - West 1st Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - West 1st Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 1st Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Stairs - East	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.8	3,758	-1	$945	$1,370	$270	1.2
MB-Stairs - West	27	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	27	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.8	3,758	-1	$945	$1,370	$270	1.2
MB-Storage - Mail Room	5	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	5	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Storage - Mail Room	87	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	4,446	1	Relamp	No	87	LED - Linear Tubes: (2) 4' Lamps	Other	29	4,446	2.7	14,041	-3	$3,532	$4,400	$870	1.0
MB-Conference - West 2nd	10	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	10	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.4	1,848	0	$465	$840	$140	1.5
MB-Corridor - 2nd	26	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	26	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,409	0	$354	$1,640	$100	4.3
MB-Corridor - 2nd	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - 2nd	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	0.5	3,180	-1	$800	$810	$160	0.8
MB-Corridor - 2nd	12	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	12	LED Lamps: Biax LED Lamps	Other	56	5,475	0.3	1,734	0	$436	$460	$0	1.1
MB-Dining Area - East 2nd Break Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	1,114	0	$280	$400	$80	1.1
MB-Electrical Room - East 2nd	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East 2nd Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 2nd	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 2nd Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 2nd Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Mechanical - West 2nd Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 2nd	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Office - East 2nd	150	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	150	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	4.7	29,811	-6	$7,498	$7,580	$1,500	0.8
MB-Office - East 2nd	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Office - East 2nd	1	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Wall Switch	56	4,000	0.0	106	0	$27	$40	$0	1.5
MB-Office - East 2nd	7	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	7	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.3	1,274	0	$320	$600	$40	1.7
MB-Office - East 2nd	1	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.0	101	0	$25	$40	$0	1.6
MB-Office - West 2nd	7	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	7	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 2nd	153	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	153	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	4.8	30,408	-6	$7,648	$7,740	$1,530	0.8
MB-Office - West 2nd	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - West 2nd	22	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	22	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.7	3,062	-1	$770	$1,110	$220	1.2
MB-Office - West 2nd	26	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	26	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	1.0	4,732	-1	$1,190	$1,650	$70	1.3
MB-Office - West 2nd	1	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.0	101	0	$25	$40	$0	1.6
MB-Restroom - East 2nd Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 2nd Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 2nd Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 2nd Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - West 2nd Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 2nd Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Computer Lab - East 3rd	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	554	0	$139	$480	$70	2.9
MB-Conference - East 3rd	8	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.2	810	0	$204	$300	$0	1.5
MB-Conference - West 3rd	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Corridor - 3rd	24	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	24	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,301	0	$327	$1,520	$100	4.3
MB-Corridor - 3rd	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - 3rd	8	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Other	56	5,475	0.2	1,156	0	$291	$300	$0	1.0
MB-Dining Area - East 3rd Break Room	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	1,114	0	$280	$400	$80	1.1
MB-Dining Area - West 3rd Break Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Electrical Room - East 3rd	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 3rd	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 3rd Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 3rd Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Mechanical - West 3rd Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 3rd	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - East 3rd	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
MB-Office - East 3rd	174	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	174	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	5.4	34,581	-7	$8,698	$8,800	$1,740	0.8
MB-Office - East 3rd	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - East 3rd	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	1,114	0	$280	$400	$80	1.1
MB-Office - East 3rd	24	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	24	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.9	4,368	-1	$1,099	$1,570	$70	1.4
MB-Office - East 3rd	8	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.2	810	0	$204	$300	$0	1.5
MB-Office - West 3rd	15	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	15	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 3rd	191	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	191	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	6.0	37,960	-8	$9,548	$9,660	$1,910	0.8
MB-Office - West 3rd	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
MB-Office - West 3rd	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - West 3rd	36	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	36	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	1.1	5,011	-1	$1,260	$1,820	$360	1.2
MB-Office - West 3rd	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.5	2,217	0	$558	$940	$160	1.4
MB-Office - West 3rd	9	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	9	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.4	1,638	0	$412	$670	$40	1.5
MB-Office - West 3rd	8	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.2	810	0	$204	$300	$0	1.5
MB-Restroom - East 3rd Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 3rd Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 3rd Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 3rd Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - West 3rd Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Restroom - West 3rd Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Conference - East 4th	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Conference - West 4th 1	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Corridor - 4th	24	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	24	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,301	0	$327	$1,520	$100	4.3
MB-Corridor - 4th	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - 4th	8	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Other	56	5,475	0.2	1,156	0	$291	$300	$0	1.0
MB-Dining Area - East 4th Break Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Electrical Room - East 4th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East 4th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 4th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 4th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 4th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Mechanical - West 4th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 4th	1	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	1	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - East 4th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - East 4th	197	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	197	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	6.1	39,152	-8	$9,848	$9,960	$1,970	0.8
MB-Office - East 4th	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,000	0.0	145	0	$37	$50	$10	1.1
MB-Office - East 4th	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	1,114	0	$280	$400	$80	1.1
MB-Office - East 4th	6	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	6	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.2	1,092	0	$275	$560	$40	1.9
MB-Office - East 4th	8	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.2	810	0	$204	$300	$0	1.5
MB-Office - West 4th	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 4th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - West 4th	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,000	0.0	145	0	$37	$50	$10	1.1
MB-Office - West 4th	216	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	216	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	6.7	42,928	-9	$10,798	$10,920	$2,160	0.8
MB-Office - West 4th	16	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	16	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.5	2,227	0	$560	$810	$160	1.2

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Office - West 4th	4	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.2	728	0	$183	$480	$40	2.4
MB-Office - West 4th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Restroom - East 4th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 4th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 4th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 4th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - West 4th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 4th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Storage - East 4th 1	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.3	1,478	0	$372	$730	$120	1.6
MB-Conference - West 5th 1	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	1,114	0	$280	$400	$80	1.1
MB-Corridor - 5th	24	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	24	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,301	0	$327	$1,520	$100	4.3
MB-Corridor - 5th	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - 5th	8	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Other	56	5,475	0.2	1,156	0	$291	$300	$0	1.0
MB-Dining Area - East 5th Break Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Dining Area - West 5th Break Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Electrical Room - East 5th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East 5th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 5th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 5th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 5th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Mechanical - Storage	8	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	8	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.3	1,478	0	$372	$730	$120	1.6
MB-Mechanical - West 5th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 5th	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - East 5th	145	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	145	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	4.5	28,818	-6	$7,248	$7,330	$1,450	0.8
MB-Office - East 5th	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,000	0.0	145	0	$37	$50	$10	1.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Office - East 5th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - East 5th	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Office - East 5th	12	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	12	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.5	2,217	0	$558	$940	$160	1.4
MB-Office - East 5th	4	Linear Fluorescent - T8: 4' T8 (32W) - 4L	Wall Switch	S	114	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (4) 4' Lamps	Occupancy Sensor	58	2,760	0.3	1,302	0	$328	$680	$120	1.7
MB-Office - East 5th	20	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	20	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.8	3,640	-1	$915	$1,420	$70	1.5
MB-Office - East 5th	1	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.0	101	0	$25	$40	$0	1.6
MB-Office - West 5th	12	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	12	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 5th	171	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	171	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	5.3	33,985	-7	$8,548	$8,650	$1,710	0.8
MB-Office - West 5th	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	554	0	$139	$480	$70	2.9
MB-Office - West 5th	37	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	37	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	1.2	5,150	-1	$1,295	$1,870	$370	1.2
MB-Office - West 5th	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - West 5th	25	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	25	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	1.0	4,550	-1	$1,144	$1,610	$70	1.3
MB-Office - West 5th	12	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	12	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.3	1,215	0	$306	$460	$0	1.5
MB-Restroom - East 5th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 5th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 5th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Computer Lab - Server Room East	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Computer Lab - Server Room East	18	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	18	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.7	3,326	-1	$836	$1,570	$250	1.6
MB-Conference - East 6th 1	2	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	2	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Conference - East 6th 1	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.6	2,587	-1	$651	$1,040	$180	1.3
MB-Conference - East 6th 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	278	0	$70	$100	$20	1.1
MB-Conference - East 6th 1	10	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	10	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.4	1,820	0	$458	$710	$40	1.5
MB-Conference - East 6th 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Corridor - 6th	24	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	24	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,301	0	$327	$1,520	$100	4.3
MB-Corridor - 6th	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Corridor - 6th	8	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Other	56	5,475	0.2	1,156	0	$291	$300	$0	1.0
MB-Dining Area - East 6th	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Electrical Room - East 6th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East 6th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 6th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 6th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 6th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Mechanical - West 6th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 6th	12	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	12	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - East 6th	94	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	94	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	2.9	18,682	-4	$4,699	$4,750	$940	0.8
MB-Office - East 6th	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.6	2,784	-1	$700	$1,010	$200	1.2
MB-Office - East 6th	20	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	20	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.8	3,640	-1	$915	$1,420	$70	1.5
MB-Office - West 6th	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 6th	163	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	163	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	5.1	32,395	-7	$8,148	$8,240	$1,630	0.8
MB-Office - West 6th	8	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.3	1,456	0	$366	$630	$40	1.6
MB-Office - West 6th	16	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	16	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.4	1,620	0	$407	$610	$0	1.5
MB-Restroom - East 6th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 6th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 6th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 6th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - West 6th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 6th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Storage - East 6th	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	554	0	$139	$480	$70	2.9
MB-Conference - West 7th	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Corridor - 7th	24	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	24	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,301	0	$327	$1,520	$100	4.3

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Corridor - 7th	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - 7th	8	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Other	56	5,475	0.2	1,156	0	$291	$300	$0	1.0
MB-Dining Area - East 7th Break Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Dining Area - West 7th Break Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Electrical Room - East 7th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East 7th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 7th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 7th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 7th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Mechanical - West 7th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 7th	13	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	13	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - East 7th	103	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	103	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	3.2	20,470	-4	$5,149	$5,210	$1,030	0.8
MB-Office - East 7th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	278	0	$70	$100	$20	1.1
MB-Office - East 7th	6	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	6	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.2	1,092	0	$275	$560	$40	1.9
MB-Office - East 7th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Office - West 7th	13	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	13	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 7th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Office - West 7th	88	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	88	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	2.7	17,489	-4	$4,399	$4,450	$880	0.8
MB-Office - West 7th	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Office - West 7th	4	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.2	728	0	$183	$480	$40	2.4
MB-Office - West 7th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Restroom - East 7th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 7th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 7th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 7th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Restroom - West 7th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 7th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Storage - East 7th 1	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	278	0	$70	$100	$20	1.1
MB-Storage - East 7th 2	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Conference - East 8th Training Room	3	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	3	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Conference - East 8th Training Room	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.8	3,880	-1	$976	$1,720	$280	1.5
MB-Conference - West 8th	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Conference - West 8th 2	5	Compact Fluorescent: (2) 16W Plug-In Lamps	Wall Switch	S	32	4,000	1, 2	Relamp	Yes	5	LED Lamps: Plug-In LED Lamps	Occupancy Sensor	23	2,760	0.1	355	0	$89	$650	$60	6.6
MB-Conference - West 8th 2	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Corridor - 8th	24	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	24	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,301	0	$327	$1,520	$100	4.3
MB-Corridor - 8th	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - 8th	8	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Other	56	5,475	0.2	1,156	0	$291	$300	$0	1.0
MB-Dining Area - East 8th Break Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Dining Area - West 8th Break Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
MB-Electrical Room - East 8th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East 8th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 8th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 8th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 8th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Mechanical - West 8th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 8th	11	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	11	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - East 8th	69	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	69	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	2.2	13,713	-3	$3,449	$3,490	$690	0.8
MB-Office - East 8th	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.2	835	0	$210	$300	$60	1.1
MB-Office - East 8th	17	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	17	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.7	3,094	-1	$778	$1,300	$70	1.6
MB-Office - East 8th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Office - West 8th	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 8th	86	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	86	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	2.7	17,092	-4	$4,299	$4,350	$860	0.8
MB-Office - West 8th	21	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	21	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.7	2,923	-1	$735	$1,060	$210	1.2
MB-Office - West 8th	1	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Wall Switch	56	4,000	0.0	106	0	$27	$40	$0	1.5
MB-Office - West 8th	8	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.2	810	0	$204	$300	$0	1.5
MB-Office - West 8th Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Restroom - East 8th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 8th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 8th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 8th Conference	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.0	139	0	$35	$50	$10	1.1
MB-Restroom - West 8th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - West 8th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 8th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Storage - East 8th	7	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	7	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.3	1,293	0	$325	$680	$110	1.8
MB-Storage - East 8th 2	1	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1	Relamp	No	1	LED Lamps: Biax LED Lamps	Wall Switch	56	4,000	0.0	106	0	$27	$40	$0	1.5
MB-Conference - East 9th	3	Compact Fluorescent: (2) 16W Plug-In Lamps	Wall Switch	S	32	4,000	1, 2	Relamp	Yes	3	LED Lamps: Plug-In LED Lamps	Occupancy Sensor	23	2,760	0.0	213	0	$54	$520	$50	8.8
MB-Conference - East 9th	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	554	0	$139	$480	$70	2.9
MB-Conference - West 9th	6	Compact Fluorescent: (2) 16W Plug-In Lamps	Occupancy Sensor	S	32	3,835	1	Relamp	No	6	LED Lamps: Plug-In LED Lamps	Occupancy Sensor	23	3,835	0.1	228	0	$57	$380	$20	6.3
MB-Conference - West 9th	8	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.2	810	0	$204	$300	$0	1.5
MB-Corridor - 9th	23	Compact Fluorescent: (2) 16W Plug-In Lamps	Other	S	32	5,475	1	Relamp	No	23	LED Lamps: Plug-In LED Lamps	Other	23	5,475	0.2	1,247	0	$314	$1,450	$90	4.3
MB-Corridor - 9th	4	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	4	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Corridor - 9th	8	Compact Fluorescent: (2) 40W Biax Lamps	Other	S	80	5,475	1	Relamp	No	8	LED Lamps: Biax LED Lamps	Other	56	5,475	0.2	1,156	0	$291	$300	$0	1.0
MB-Dining Area - East 9th Break Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Dining Area - West 9th Break Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Dining Area - West 9th Pantry	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.0	139	0	$35	$50	$10	1.1

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Electrical Room - East 9th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - East 9th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Electrical Room - West 9th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	278	0	$70	$100	$20	1.1
MB-Electrical Room - West 9th Telecomm Closet	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Mechanical - East 9th Fan Room	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
MB-Mechanical - West 9th Fan Room	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - East 9th	10	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	10	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - East 9th	37	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	37	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	1.2	7,353	-2	$1,850	$1,870	$370	0.8
MB-Office - East 9th	14	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	14	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.4	1,949	0	$490	$710	$140	1.2
MB-Office - East 9th	19	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	19	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.7	3,458	-1	$870	$1,380	$70	1.5
MB-Office - East 9th	28	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	28	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.6	2,835	-1	$713	$1,060	$0	1.5
MB-Office - East 9th Law Library	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Office - West 9th	3	Compact Fluorescent: (2) 16W Plug-In Lamps	Occupancy Sensor	S	32	3,835	1	Relamp	No	3	LED Lamps: Plug-In LED Lamps	Occupancy Sensor	23	3,835	0.0	114	0	$29	$190	$10	6.3
MB-Office - West 9th	8	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	8	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
MB-Office - West 9th	20	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Other	S	62	5,475	1	Relamp	No	20	LED - Linear Tubes: (2) 4' Lamps	Other	29	5,475	0.6	3,975	-1	$1,000	$1,010	$200	0.8
MB-Office - West 9th	2	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	2	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.0	202	0	$51	$80	$0	1.6
MB-Office - West 9th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Office - West 9th	6	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	6	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	607	0	$153	$230	$0	1.5
MB-Office - West 9th	4	Compact Fluorescent: (2) 40W Biax Lamps	Wall Switch	S	80	4,000	1, 2	Relamp	Yes	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	2,760	0.2	728	0	$183	$480	$40	2.4
MB-Office - West 9th	35	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	35	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.8	3,543	-1	$891	$1,330	$0	1.5
MB-Office - West 9th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Office - West 9th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Office - West 9th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Office - West 9th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5
MB-Office - West 9th	4	Compact Fluorescent: (2) 40W Biax Lamps	Occupancy Sensor	S	80	3,835	1	Relamp	No	4	LED Lamps: Biax LED Lamps	Occupancy Sensor	56	3,835	0.1	405	0	$102	$150	$0	1.5

	Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Fixture Quantity	Fixture Description	Control System	Light Level	Watts per Fixture	Annual Operating Hours	ECM #	Fixture Recommendation	Add Controls?	Fixture Quantity	Fixture Description	Control System	Watts per Fixture	Annual Operating Hours	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Office - West 9th Copy Room	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Restroom - East 9th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - East 9th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - East 9th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 9th Chief Admin	2	Compact Fluorescent: (2) 16W Plug-In Lamps	Wall Switch	S	32	4,000	1, 2	Relamp	Yes	2	LED Lamps: Plug-In LED Lamps	Occupancy Sensor	23	2,760	0.0	142	0	$36	$280	$30	7.0
MB-Restroom - West 9th Men's	1	Incandescent: (1) 60W A19 Screw-In Lamp	Wall Switch	S	60	4,000	1	Relamp	No	1	LED Lamps: A19 Lamps	Wall Switch	9	4,000	0.0	224	0	$56	$30	$0	0.5
MB-Restroom - West 9th Men's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Restroom - West 9th Women's	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Occupancy Sensor	S	62	3,835	1	Relamp	No	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	3,835	0.1	557	0	$140	$200	$40	1.1
MB-Storage - East 9th	1	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1	Relamp	No	1	LED - Linear Tubes: (2) 4' Lamps	Wall Switch	29	4,000	0.0	145	0	$37	$50	$10	1.1
MB-Storage - West 9th	2	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	2	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	370	0	$93	$250	$40	2.3
MB-Storage - Roof	3	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	3	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.1	554	0	$139	$480	$70	2.9
MB-Storage - Roof	6	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	6	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	1,109	0	$279	$630	$100	1.9
MB-Storage - Roof	4	Linear Fluorescent - T8: 4' T8 (32W) - 2L	Wall Switch	S	62	4,000	1, 2	Relamp	Yes	4	LED - Linear Tubes: (2) 4' Lamps	Occupancy Sensor	29	2,760	0.2	739	0	$186	$530	$80	2.4
G-Garage	16	Exit Signs: LED - 2 W Lamp	None		6	8,760		None	No	16	Exit Signs: LED - 2 W Lamp	None	6	8,760	0.0	0	0	$0	$0	$0	0.0
G-Garage	103	LED - Fixtures: Ambient 2x2 Fixture	Other	S	40	5,475		None	No	103	LED - Fixtures: Ambient 2x2 Fixture	Other	40	5,475	0.0	0	0	$0	$0	$0	0.0
G-Garage	12	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell		75	4,000		None	No	12	LED - Fixtures: Outdoor Pole/Arm-Mounted Area/Roadway Fixture	Photocell	75	4,000	0.0	0	0	$0	$0	$0	0.0
G-Garage	476	LED - Fixtures: Parking Garage Fixture	Occupancy Sensor	S	60	3,835		None	No	476	LED - Fixtures: Parking Garage Fixture	Occupancy Sensor	60	3,835	0.0	0	0	$0	$0	$0	0.0
G-Garage	15	LED - Fixtures: Stairwell/Passageway Lighting	Other	S	15	5,475		None	No	15	LED - Fixtures: Stairwell/Passageway Lighting	Other	15	5,475	0.0	0	0	$0	$0	$0	0.0
G-Garage	42	LED - Fixtures: Wall Pack	Occupancy Sensor	S	50	3,835		None	No	42	LED - Fixtures: Wall Pack	Occupancy Sensor	50	3,835	0.0	0	0	$0	$0	$0	0.0
G-Stairs 1	13	LED - Fixtures: Stairwell/Passageway Lighting	Occupancy Sensor	S	15	3,835		None	No	13	LED - Fixtures: Stairwell/Passageway Lighting	Occupancy Sensor	15	3,835	0.0	0	0	$0	$0	$0	0.0
G-Stairs 2	13	LED - Fixtures: Stairwell/Passageway Lighting	Occupancy Sensor	S	15	3,835		None	No	13	LED - Fixtures: Stairwell/Passageway Lighting	Occupancy Sensor	15	3,835	0.0	0	0	$0	$0	$0	0.0

Motor Inventory & Recommendations

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Exterior-Roof	AHU-1 & AHU-2	2	Supply Fan	30.00	93.0%	No			W	3,500	3	No	94.1%	Yes	2	17.4	64,499	0	$16,629	$33,400	$3,000	1.8
MB-Mechanical-Fan Rooms	AHU-3 through AHU-14	12	Supply Fan	40.00	90.2%	Yes			W	3,500		No	90.2%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Fan Rooms	AHU-15 through AHU-20	6	Supply Fan	20.00	93.0%	Yes			W	3,500		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Fan Rooms	AHU-21	1	Supply Fan	3.00	86.5%	Yes			W	3,500		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Fan Room Mezzanine	ACD-1	1	Supply Fan	10.00	89.5%	Yes			W	3,500		No	89.5%	No		0.0	0	0	$0	$0	$0	0.0
MB-Telecom Closets	Telecom Closet Cooling AHU	1	Supply Fan	0.25	68.5%	No			W	3,500		No	68.5%	No		0.0	0	0	$0	$0	$0	0.0
MB-Telecom Closets	Telecom Closet Cooling AHU	4	Supply Fan	0.75	81.8%	No			W	3,500		No	81.8%	No		0.0	0	0	$0	$0	$0	0.0
MB-Telecom Closets	Telecom Closet Cooling AHU	3	Supply Fan	1.50	84.0%	No			W	3,500	3	No	86.5%	Yes	3	1.3	5,518	0	$1,423	$13,100	$200	9.1
MB-Telecom Closets	Telecom Closet Cooling AHU	3	Supply Fan	1.50	84.0%	No			W	3,500	3	No	86.5%	Yes	3	1.3	5,518	0	$1,423	$13,100	$200	9.1
MB-Telecom Closets	Telecom Closet Cooling Unit	9	Supply Fan	0.05	65.0%	No			W	3,500		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Telecom Closets	Telecom Closet Cooling Unit	2	Supply Fan	0.50	76.2%	No			W	3,500		No	76.2%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Pump Room	Heating Hot Water Pumps	1	Heating Hot Water Pump	30.00	93.6%	Yes	Baldor	Frame 326T	W	1,650		No	93.6%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Pump Room	Chilled Water Pumps	1	Chilled Water Pump	50.00	91.7%	Yes	Baldor	Frame 326T	W	1,650		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
MB-Exterior	Exhaust Fans - Smoke	4	Exhaust Fan	10.00	89.5%	No			W	3,500	3	No	91.7%	Yes	4	12.3	45,650	0	$11,769	$30,100	$4,400	2.2
MB-Exterior	Exhaust Fans - Toilets	2	Exhaust Fan	5.00	87.5%	No			W	3,500	3	No	89.5%	Yes	2	3.1	11,640	0	$3,001	$11,300	$1,800	3.2
MB-Exterior	Exhaust Fans - Elevator Rooms	1	Exhaust Fan	0.14	65.0%	No			W	3,500		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Exterior	Exhaust Fans - Elevator Rooms	1	Exhaust Fan	0.10	65.0%	No			W	3,500		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Exterior	Exhaust Fans - General	2	Exhaust Fan	5.00	87.5%	No			W	3,500	3	No	89.5%	Yes	2	3.1	11,640	0	$3,001	$11,300	$1,800	3.2
MB-Exterior	Exhaust Fans - Telecom Closets	2	Exhaust Fan	1.50	84.0%	No			W	3,500	3	No	86.5%	Yes	2	0.9	3,679	0	$948	$8,700	$200	9.0
MB-Exterior	Exhaust Fans - Oil Storage Room	1	Exhaust Fan	0.50	78.2%	No			W	3,500		No	78.2%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Exterior	Exhaust Fan - Gas Meter Room	1	Exhaust Fan	0.33	73.4%	No			W	3,500		No	73.4%	No		0.0	0	0	$0	$0	$0	0.0
MB-Exterior	Exhaust Fan - Centrifugal	65	Exhaust Fan	1.00	82.5%	No			W	3,500	3	No	85.5%	Yes	65	20.3	82,015	0	$21,145	$256,100	$4,900	11.9
MB-Mechanical-Pump Room	Domestic Water Booster Pumps	3	Water Supply Pump	10.00	88.5%	No	US Motors	Frame 215M	W	3,391	4	No	91.7%	Yes	3	3.3	34,177	0	$8,812	$22,600	$3,300	2.2
MB-Various Spaces	Fan Power Units FP-1	3	Supply Fan	0.10	65.0%	No			W	3,500		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Various Spaces	Fan Power Units FP-2	27	Supply Fan	0.25	68.5%	No			W	3,500		No	68.5%	No		0.0	0	0	$0	$0	$0	0.0
MB-Various Spaces	Fan Power Units FP-3	85	Supply Fan	0.33	73.4%	No			W	3,500		No	73.4%	No		0.0	0	0	$0	$0	$0	0.0
MB-Various Spaces	Fan Power Units FP-4	70	Supply Fan	0.75	81.8%	No			W	3,500		No	81.8%	No		0.0	0	0	$0	$0	$0	0.0
MB-Various Spaces	Fan Power Unit FP-5	1	Supply Fan	0.75	81.8%	No			W	3,500		No	81.8%	No		0.0	0	0	$0	$0	$0	0.0
MB-Fan Rooms	DHW Circulating Pumps	1	DHW Circulation Pump	1.50	8400.0%	No			W	8,760		No	8400.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Fan Rooms	DHW Circulating Pumps	2	DHW Circulation Pump	0.33	73.4%	No			W	8,760		No	73.4%	No		0.0	0	0	$0	$0	$0	0.0
MB-Fan Rooms	DHW Circulating Pumps	1	DHW Circulation Pump	0.50	78.2%	No			W	8,760		No	78.2%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Pump Room	Temperature Control Air Compressor	2	Air Compressor	15.00	93.0%	No			W	1,000		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Fire Pump Room	Electric Fire Pump	1	Process Pump	150.00	95.0%	No	Marathon	XM405TSDS7321	W	40		No	95.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Stairwells	Stair Pressurization Supply Fans	4	Supply Fan	15.00	91.0%	No			W	3,500	3	No	93.0%	Yes	4	17.7	67,057	0	$17,289	$41,200	$4,800	2.1
MB-Fan Rooms	DHW Circulating Pumps	6	DHW Circulation Pump	0.17	65.0%	No	Bell & Gossett	M74794	W	8,760		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Exterior-Roof	York D2CE RTU Supply Fan	2	Supply Fan	5.00	87.5%	No			B	3,500	3	No	89.5%	Yes	2	3.0	11,640	0	$3,001	$11,300	$1,800	3.2
MB-Storage-Roof	Elevator Motors	6	Other	30.00	88.0%	No			W	400		No	88.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Storage-Roof	Sprinkler System Circulation Pump	1	Other	0.17	65.0%	No			W	1,500		No	65.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-East 9th Fan Room	Sprinkler System Circulation Pump	1	Other	0.33	72.4%	No			W	1,500		No	72.4%	No		0.0	0	0	$0	$0	$0	0.0
MB-Pump Room	Main Sprinkler System Pump	1	Process Pump	150.00	95.0%	No			W	40		No	95.0%	No		0.0	0	0	$0	$0	$0	0.0

		Existing Conditions									Proposed Conditions					Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Motor Quantity	Motor Application	HP Per Motor	Full Load Efficiency	VFD Control?	Manufacturer	Model	Remaining Useful Life	Annual Operating Hours	ECM #	Install High Efficiency Motors?	Full Load Efficiency	Install VFDs?	Number of VFDs	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Elevator-Garage Elevator Room	Elevator Motor	1	Other	30.00	88.0%	No			W	400		No	88.0%	No		0.0	0	0	$0	$0	$0	0.0
MB-Elevator-Garage Elevator Room	Elevator Motor	1	Other	25.00	91.7%	No			W	400		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
MB-Pump Room	Unlabeled System Motor	1	Other	0.50	76.2%	No			W	1,500		No	76.2%	No		0.0	0	0	$0	$0	$0	0.0
MB-Fire Pump Room	Unlabeled System Motor	2	Other	0.75	81.8%	No			W	1,500		No	81.8%	No		0.0	0	0	$0	$0	$0	0.0
MB-Fire Pump Room	Unlabeled Air Compressor System Motor	1	Air Compressor	0.75	81.8%	No			W	1,000		No	81.8%	No		0.0	0	0	$0	$0	$0	0.0
MB-Pump Room	Unlabeled System Motor	1	Other	2.00	84.5%	No			W	1,500		No	84.5%	No		0.0	0	0	$0	$0	$0	0.0
MB-Pump Room	Unlabeled System Motor	1	Other	1.50	83.8%	No	GE Motors		W	1,500		No	83.8%	No		0.0	0	0	$0	$0	$0	0.0
MB-Storage-Mail Room	Air Compressors	3	Air Compressor	3.00	86.5%	No			W	1,000		No	86.5%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Fire Pump Room	Fire System Pneumatic Control Air Compressor	1	Air Compressor	0.75	81.8%	No			W	1,000		No	81.8%	No		0.0	0	0	$0	$0	$0	0.0
MB-Exterior-Roof	Make-Up Air Unit Supply Fan	4	Supply Fan	15.00	91.0%	No			B	3,500	3	No	93.0%	Yes	4	17.7	67,057	0	$17,289	$41,200	$4,800	2.1
G-Garage	Hydronic Unit Heater Supply Fan	1	Supply Fan	0.50	76.2%	No			B	3,500		No	76.2%	No		0.0	0	0	$0	$0	$0	0.0
G-Garage	Ventilation Exhaust Fans EFM-1 through EFM-4 & EFG-1 through EFG-4	8	Exhaust Fan	1.50	83.8%	No			B	3,500	3	No	86.5%	Yes	8	3.7	14,809	0	$3,818	$34,900	$600	9.0
Mechanical Room - Garage	Garage - Exhaust Fan	1	Exhaust Fan	20.00	91.0%	No			W	3,500	3	No	93.0%	Yes	1	6.1	22,352	0	$5,763	$12,200	$1,300	1.9
MB-Mechanical-Pump Room	Chilled Water Pumps	1	Chilled Water Pump	50.00	94.1%	Yes	WEG	Frame 326T	W	1,650		No	94.1%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Pump Room	Chilled Water Pumps	1	Chilled Water Pump	50.00	94.5%	Yes	US Motors	Frame 326T	W	1,650		No	94.5%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Pump Room	Heating Hot Water Pumps	1	Heating Hot Water Pump	50.00	91.7%	Yes	Baldor	Frame 326T	W	1,650		No	91.7%	No		0.0	0	0	$0	$0	$0	0.0
MB-Mechanical-Pump Room	Heating Hot Water Pumps	1	Heating Hot Water Pump	50.00	93.0%	Yes	Baldor	Frame 326T	W	1,650		No	93.0%	No		0.0	0	0	$0	$0	$0	0.0

Packaged HVAC Inventory & Recommendations

		Existing Conditions									Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Cooling Capacity per Unit (Tons)	Heating Capacity per Unit (MBh)	Cooling Mode Efficiency (SEER/IEER/ EER)	Heating Mode Efficiency	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Exterior-Roof	Interior Spaces	1	Package Unit	10.00		10.30		York	D2CE10----	B	5	Yes	1	Package Unit	10.00		14.00		1.5	2,217	0	$572	$14,800	$800	24.5
MB-Computer Lab-Server Room	Server Room - Portable ACs	2	Window AC	1.00		10.00		MovinCool	Office Pro 12	W		No							0.0	0	0	$0	$0	$0	0.0
MB-Interior Spaces	Various Spaces	8	Electric Resistance Heat		10.24		1 Et	Trane	UHEC	W		No							0.0	0	0	$0	$0	$0	0.0
MB-Interior Spaces	Various Spaces	3	Electric Resistance Heat		23.88		1 Et	Trane	UHEC	W		No							0.0	0	0	$0	$0	$0	0.0
MB-Interior Spaces	Various Spaces	5	Electric Resistance Heat		17.06		1 Et	Sentanel	BUHA-0D74	W		No							0.0	0	0	$0	$0	$0	0.0
MB-Interior Spaces	Various Spaces	1	Electric Resistance Heat		34.12		1 Et	Trane	UHEC	W		No							0.0	0	0	$0	$0	$0	0.0

Electric Chiller Inventory & Recommendations

		Existing Conditions						Proposed Conditions								Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	Chiller Quantity	System Type	Cooling Capacity per Unit (Tons)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency Chillers?	Chiller Quantity	System Type	Constant/ Variable Speed	Cooling Capacity (Tons)	Full Load Efficiency (kW/Ton)	IPLV Efficiency (kW/Ton)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
G-Garage	Interior Spaces	1	Air-Cooled Reciprocating Chiller	15.00	Carrier	30GT-015--600	B	6	Yes	1	Air-Cooled Centrifugal Chiller	Variable	15.00	1.24	0.74	-2.1	1,398	0	$360	$44,300	$1,400	119.0
Vicinity Power Plant	Prxi Chiller	1	Air-Cooled Reciprocating Chiller	1,500.00	Prxi Chiller		W		No							0.0	0	0	$0	$0	$0	0.0

Space Heating Boiler Inventory & Recommendations

		Existing Conditions						Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Output Capacity per Unit (MBh)	Manufacturer	Model	Remaining Useful Life	ECM #	Install High Efficiency System?	System Quantity	System Type	Output Capacity per Unit (MBh)	Heating Efficiency	Heating Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
Vicinity Power Plant	Proxi Boiler	1	Non-Condensing Hot Water Boiler	10,000	Proxi Boiler		W		No						0.0	0	0	$0	$0	$0	0.0

Pipe Insulation Recommendations

		Recommendation Inputs			Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Affected	ECM #	Length of Uninsulated Pipe (ft)	Pipe Diameter (in)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Mechanical - Fan Room Mezzanine East Mailroom	Mezzanine Restrooms & Pantry	7	10	1.00	0.0	931	0	$240	$110	$20	0.4
MB-Mechanical - East 2nd Fan Room	East 3rd & 2nd Floor Restrooms	7	10	1.00	0.0	931	0	$240	$110	$20	0.4
MB-Mechanical - West 2nd Fan Room	West 3rd & 2nd Floor Restrooms	7	10	1.00	0.0	931	0	$240	$110	$20	0.4
MB-Mechanical - East 5th Fan Room	East 6th, 5th, & 4th Floor Restrooms	7	10	1.00	0.0	931	0	$240	$110	$20	0.4
MB-Mechanical - West 5th Fan Room	West 6th, 5th, & 4th Floor Restrooms	7	10	1.00	0.0	931	0	$240	$110	$20	0.4
MB-Mechanical - East 8th Fan Room	East 9th, 8th, & 7th Floor Restrooms	7	10	1.00	0.0	931	0	$240	$110	$20	0.4

DHW Inventory & Recommendations

		Existing Conditions					Proposed Conditions							Energy Impact & Financial Analysis						
Location	Area(s)/System(s) Served	System Quantity	System Type	Manufacturer	Model	Remaining Useful Life	ECM #	Replace?	System Quantity	System Type	Fuel Type	System Efficiency	Efficiency Units	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB - Mechanical - Fan Room Mezzanine East Mailroom	Mezzanine Restrooms & Pantry	1	Storage Tank Water Heater (≤ 50 Gal)	Bradford White	LE240S3-3NHPP	W		No						0.0	0	0	$0	$0	$0	0.0
MB - Mechanical - West 1st Fan Room	West 1st Floor Restrooms	1	Storage Tank Water Heater (≤ 50 Gal)	Hubbell	SE40-0-5SLT	W		No						0.0	0	0	$0	$0	$0	0.0
MB - Mechanical - East 2nd Fan Room	2nd & 2nd Floor Restrooms	1	Storage Tank Water Heater (> 50 Gal)	Hubbell	SE80-0-6SLT4	W		No						0.0	0	0	$0	$0	$0	0.0
MB - Mechanical - West 2nd Fan Room	3rd & 2nd Floor Restrooms	1	Storage Tank Water Heater (> 50 Gal)	Hubbell	SE80-0-6SLT5	W		No						0.0	0	0	$0	$0	$0	0.0
MB - Mechanical - East 5th Fan Room	6th, 5th, & 4th Floor Restrooms	1	Storage Tank Water Heater (> 50 Gal)	A.O Smith	DRE-80-920	B		No						0.0	0	0	$0	$0	$0	0.0
MB - Mechanical - West 5th Fan Room	6th, 5th, & 4th Floor Restrooms	1	Storage Tank Water Heater (> 50 Gal)	Bradford White	MII80-9-3SF-014	W		No						0.0	0	0	$0	$0	$0	0.0
MB - Mechanical - East 8th Fan Room	9th, 8th, & 7th Floor Restrooms	1	Storage Tank Water Heater (> 50 Gal)	A.O Smith	DRE-80-920	B		No						0.0	0	0	$0	$0	$0	0.0
MB - Mechanical - West 8th Fan Room	9th, 8th, & 7th Floor Restrooms	1	Storage Tank Water Heater (> 50 Gal)	Bradford White	MII80-9-3SF-014	W		No						0.0	0	0	$0	$0	$0	0.0
MB-Restrooms	Various Restrooms	19	Tankless Water Heater	Hubbell	Insta-Hot MDT9000	W		No						0.0	0	0	$0	$0	$0	0.0

Low-Flow Device Recommendations

	Recommedation Inputs					Energy Impact & Financial Analysis						
Location	ECM #	Device Quantity	Device Type	Existing Flow Rate (gpm)	Proposed Flow Rate (gpm)	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Various Locations	8	4	Faucet Aerator (Lavatory)	2.20	0.50	0.0	556	0	$143	$30	$20	0.1
MB-Various Locations	8	78	Faucet Aerator (Lavatory)	0.50	0.50	0.0	0	0	$0	$660	$310	0.0

Plug Load Inventory

	Existing Conditions					
Location	Quantity	Equipment Description	Energy Rate (W)	ENERGY STAR Qualified?	Manufacturer	Model
MB-Various Spaces	20	Coffee Machine	900	No	UNKNWN	UNKNWN
MB-Various Spaces	1,045	Desktop	150	No	UNKNWN	UNKNWN
MB-Various Spaces	1	Dishwasher (Undercounter)	2,000	No	UNKNWN	UNKNWN
MB-Various Spaces	5	Fan (Large)	150	No	UNKNWN	UNKNWN
MB-Various Spaces	39	Microwave	1,000	No	UNKNWN	UNKNWN
MB-Various Spaces	16	Paper Shredder	150	No	UNKNWN	UNKNWN
MB-Various Spaces	1,054	Printer (Small/Medium)	200	No	UNKNWN	UNKNWN
MB-Various Spaces	43	Printer/Copier (Large)	600	No	UNKNWN	UNKNWN
MB-Various Spaces	1	Projector	200	No	UNKNWN	UNKNWN
MB-Various Spaces	11	Refrigerator (Mini)	153	No	UNKNWN	UNKNWN
MB-Various Spaces	22	Refrigerator (Residential)	156	No	UNKNWN	UNKNWN
MB-Various Spaces	2	Speakers (Medium/Small)	150	No	UNKNWN	UNKNWN
MB-Various Spaces	18	Television	100	No	UNKNWN	UNKNWN
MB-Various Spaces	8	Toaster	850	No	UNKNWN	UNKNWN
MB-Various Spaces	23	Toaster Oven	1,200	No	UNKNWN	UNKNWN
MB-Various Spaces	13	Water Cooler	500	No	UNKNWN	UNKNWN
MB-Various Spaces	10	Various Misc Plug Load	1,000	No	UNKNWN	UNKNWN

Vending Machine Inventory & Recommendations

	Existing Conditions		Proposed Conditions		Energy Impact & Financial Analysis						
Location	Quantity	Vending Machine Type	ECM #	Install Controls?	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Total Incentives	Simple Payback w/ Incentives in Years
MB-Various Spaces	10	Refrigerated	9	Yes	1.8	16,118	0	$4,156	$2,680	$500	0.5
MB-Various Spaces	12	Non-Refrigerated	9	Yes	0.5	4,110	0	$1,060	$3,210	$0	3.0
MB-Various Spaces	2	Glass Fronted Refrigerated	9	Yes	0.3	2,418	0	$623	$540	$100	0.7

Miscellaneous Fuel Inventory

Location	Existing Conditions					
	Quantity	Equipment Description	Input Capacity per Unit (MBh)	ENERGY STAR Qualified?	Manufacturer	Model
DMVC	6	Level 2 EV Charging Station	68.9	No	Chargepoint+	CP6000
Garage	3	UPS & IT Equipment	8.2	No	0	0

Custom (High Level) Measure Analysis

Retro-Commissioning Study

Building Square Footage 396,203
Percent of Conditioned Area Impacted 100%
Fuel Utility Rate $30.104 MMBtu
Blended Electric Utility Rate $0.258 kWh

Existing Conditions						Proposed Conditions					Energy Impact & Financial Analysis										
Description	Area(s)/System(s) Served	Remaining Useful Life	Total HVAC Motor Usage kWh	Total HVAC Electric Usage kWh	Total HVAC Fuel Usage MMBtu	Description	% Savings HVAC Motor Usage kWh	% Savings HVAC Electric Usage kWh	% Savings HVAC Fuel Usage MMBtu	Estimated Cost per Sqft	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Simple Payback w/ Incentives in Years
HVAC Controls Not Currently Optimized	HVAC Equipment & Systems	3	2,489,980	1,968,611	17,500	Retro-Commissioning Study	10%	5%	5%	$1.50	0.00	347,429	875	$115,916	$691,800	$0	$0	$0	$691,800	5.97	5.97

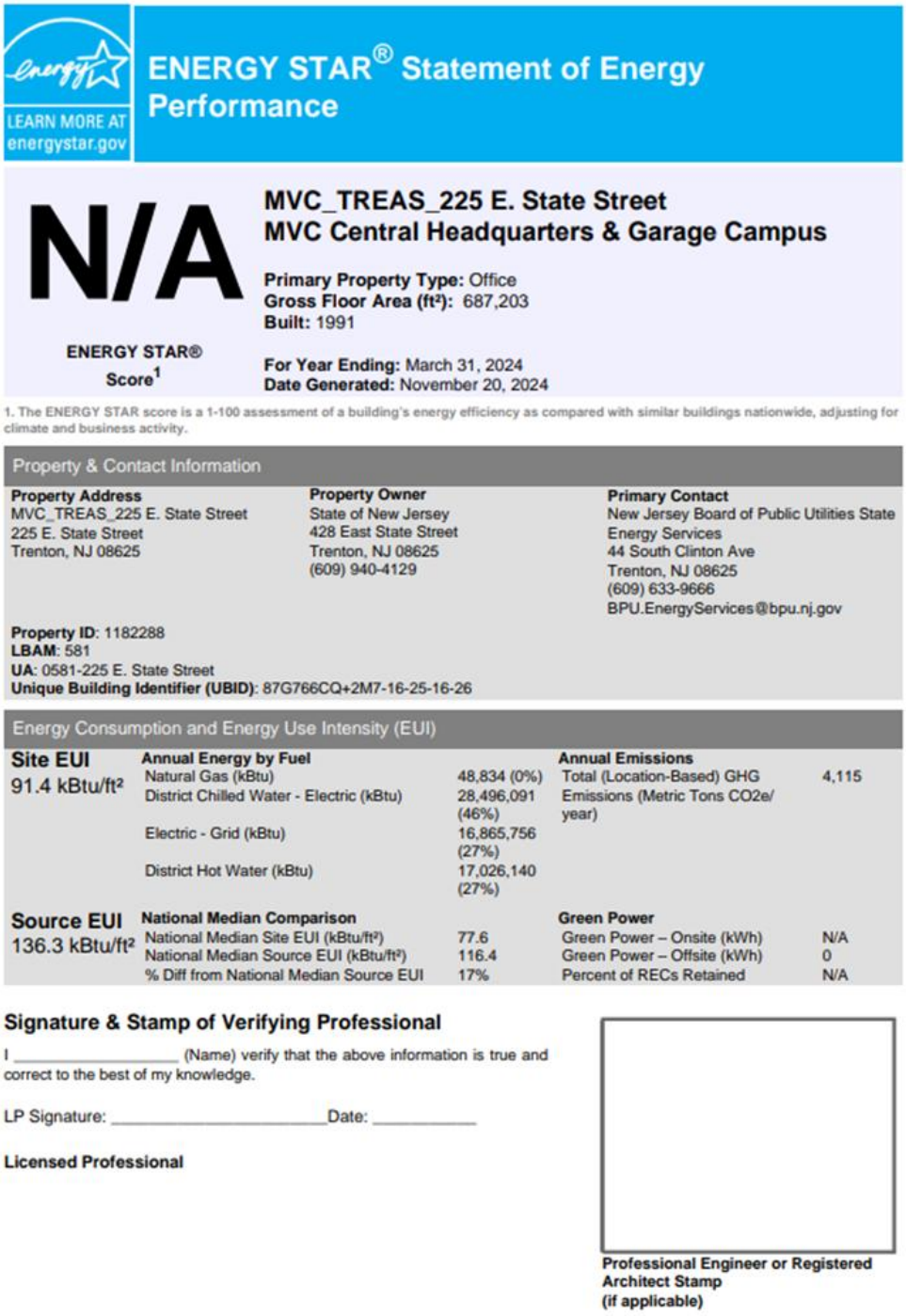
Electric Tank Water Heater to HPWH

NOTE: HPWH calculation should not be used for existing water heaters with a storage capacity greater than 120 gal or less than 30 gal.

Existing Conditions						Proposed Conditions				Energy Impact & Financial Analysis										
Description	Area(s)/System(s) Served	SF of Area Served	Fuel Type	Input Capacity per Unit (kW)	Tank Capacity per Unit (Gal)	Description	COP	Tank Capacity per Unit (Gal)	Estimated Unit Cost	Total Peak kW Savings	Total Annual kWh Savings	Total Annual MMBtu Savings	Total Annual Energy Cost Savings	Estimated M&L Cost ($)	Base Incentives	Enhanced Incentives	Total Incentives	Total Net Cost	Payback w/o Incentives in Years	Payback w/ Incentives in Years
Storage Tank Water Heater (≤50 Gal)	Mezzanine Restrooms & Pantry	10,000	Electric	6.0	40	Heat Pump Water Heater	2.5	40	$2,091.00	0.00	8,441	0	$2,176	$2,500	$0	$0	$0	$2,500	1.15	1.15
Storage Tank Water Heater (≤50 Gal)	West 1st Floor Restrooms	10,000	Electric	5.0	40	Heat Pump Water Heater	2.5	40	$2,091.00	0.00	8,441	0	$2,176	$2,500	$0	$0	$0	$2,500	1.15	1.15
Storage Tank Water Heater (>50 Gal)	East 3rd & 2nd Floor Restrooms	20,000	Electric	6.0	80	Heat Pump Water Heater	2.5	80	$3,322.98	0.00	16,882	0	$4,353	$4,000	$0	$0	$0	$4,000	0.92	0.92
Storage Tank Water Heater (>50 Gal)	West 3rd and 2nd Floor Restrooms	20,000	Electric	6.0	80	Heat Pump Water Heater	2.5	80	$3,322.98	0.00	16,882	0	$4,353	$4,000	$0	$0	$0	$4,000	0.92	0.92
Storage Tank Water Heater (>50 Gal)	East 6th, 5th, & 4th Floor Restrooms	20,000	Electric	9.0	80	Heat Pump Water Heater	2.5	80	$3,322.98	0.00	16,882	0	$4,353	$4,000	$0	$0	$0	$4,000	0.92	0.92
Storage Tank Water Heater (>50 Gal)	West 6th, 5th, & 4th Floor Restrooms	20,000	Electric	9.0	80	Heat Pump Water Heater	2.5	80	$3,322.98	0.00	16,882	0	$4,353	$4,000	$0	$0	$0	$4,000	0.92	0.92
Storage Tank Water Heater (>50 Gal)	East 9th, 8th, & 7th Floor Restrooms	20,000	Electric	9.0	80	Heat Pump Water Heater	2.5	80	$3,322.98	0.00	16,882	0	$4,353	$4,000	$0	$0	$0	$4,000	0.92	0.92
Storage Tank Water Heater (>50 Gal)	West 9th, 8th, & 7th Floor Restrooms	20,000	Electric	9.0	80	Heat Pump Water Heater	2.5	80	$3,322.98	0.00	16,882	0	$4,353	$4,000	$0	$0	$0	$4,000	0.92	0.92

APPENDIX B: ENERGY STAR STATEMENT OF ENERGY PERFORMANCE

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



ENERGY STAR® Statement of Energy Performance

LEARN MORE AT energystar.gov

N/A

ENERGY STAR® Score[1]

MVC_TREAS_225 E. State Street
MVC Central Headquarters & Garage Campus

Primary Property Type: Office
Gross Floor Area (ft²): 687,203
Built: 1991

For Year Ending: March 31, 2024
Date Generated: November 20, 2024

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

Property & Contact Information

Property Address	Property Owner	Primary Contact
MVC_TREAS_225 E. State Street 225 E. State Street Trenton, NJ 08625	State of New Jersey 428 East State Street Trenton, NJ 08625 (609) 940-4129	New Jersey Board of Public Utilities State Energy Services 44 South Clinton Ave Trenton, NJ 08625 (609) 633-9666 BPU.EnergyServices@bpu.nj.gov

Property ID: 1182288
LBAM: 581
UA: 0581-225 E. State Street
Unique Building Identifier (UBID): 87G766CQ+2M7-16-25-16-26

Energy Consumption and Energy Use Intensity (EUI)

Site EUI
91.4 kBtu/ft²

Annual Energy by Fuel	
Natural Gas (kBtu)	48,834 (0%)
District Chilled Water - Electric (kBtu)	28,496,091 (46%)
Electric - Grid (kBtu)	16,865,756 (27%)
District Hot Water (kBtu)	17,026,140 (27%)

Annual Emissions	
Total (Location-Based) GHG Emissions (Metric Tons CO2e/ year)	4,115

Source EUI
136.3 kBtu/ft²

National Median Comparison	
National Median Site EUI (kBtu/ft²)	77.6
National Median Source EUI (kBtu/ft²)	116.4
% Diff from National Median Source EUI	17%

Green Power	
Green Power – Onsite (kWh)	N/A
Green Power – Offsite (kWh)	0
Percent of RECs Retained	N/A

Signature & Stamp of Verifying Professional

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

LP Signature: _____ Date: _____

Licensed Professional

Professional Engineer or Registered Architect Stamp (if applicable)

APPENDIX C: GLOSSARY

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

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

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