Town of Weymouth, Massachusetts

ENERGY REDUCTION PLAN

In fulfillment of the

MASSACHUSETTS GREEN COMMUNITIES GRANT PROGRAM

CRITERIA 3

Prepared by:

Town of Weymouth

With support from:

Energy Conservation, Inc.

Hanson, MA

November 25, 2015

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Purpose and Acknowledgments

This five-year Energy Reduction Plan (ERP), adopted by the Town of Weymouth, is submitted to the Massachusetts Department of Energy Resources for Green Community designation. Evaluations of all Town buildings have been made in order to determine and identify energy conservation measures (ECMs) throughout these buildings. Utility incentives have been identified and indicated where applicable. Energy audits and recommendations were provided by Energy Conservation, Inc. (ECI), a Project Expeditor for National Grid.

Street lighting throughout the Town and an inventory of those systems, as well as a spreadsheet from ECI for the purchase of these systems from National Grid and their upgrade to Light Emitting Diode (LED) technology, is included in the appendices of this ERP. The Town is also considering the installation of photovoltaic systems and a copy of a proposal from Bluewave Capitol, dated September 14, 2015, is included in the appendices of this ERP.

In May of 2010, ECI upgraded lighting systems in all of the Town's buildings with the assistance of a federal grant received by the municipality. Incentives were also provided by National Grid for these projects, which involved the replacement, in most cases, of existing electrically- and optically-inefficient lighting systems. Lighting has been replaced throughout the Town's schools over the past twenty years by ECI. Mechanical HVAC motor replacements and the installation of Variable Frequency Drives (VFDs) were also included in these projects.

Many of the proposed lighting improvements throughout this ERP involve the retrofit of newer, optically-efficient lighting systems that have been installed throughout these buildings in recent years with LED technology. The existing fixtures are left in place, while fluorescent lamps and ballasts are removed and replaced with new LED drivers and lamps. When these projects are completed, each building will no longer be using mercury-containing fluorescent lamps.

Weatherization opportunities in every building were also identified and included in this ERP.

The following individuals have contributed and participated in the Baseline and ERP Process:

- Nicholas Bulens – Grant Writer & Researcher, Planning Department
- Paul Comerford – Director of School Facilities, School Department
- Robert Conlon – Financial Analyst, Municipal Finance Department
- Robert Luongo – Chair of the Mayor's Energy Advisory Committee
- Robert O'Connor – Energy Coordinator, Department of Public Works
- Chris Collins – President, Energy Conservation, Inc.

Executive Summary

Overview

The Town of Weymouth is a mature suburban community located in Norfolk County approximately 12 miles southeast of Boston near the crosswords of Route I-93 (128) and Route 3. Incorporated in 1635, Weymouth has a strong residential character with a fair mix of established neighborhoods, small clusters of new developments, and several large apartment complexes. Most housing units are owner-occupied, single-family homes concentrated around four village centers. Renter-occupied units account for about one third of the housing inventory, and Chapter 40B subsidized units makes up 8.1 percent. As a bedroom community, Weymouth has three MBTA Commuter Rail Stations, numerous local and state parks, and premier medical facilities along Route 18, including the South Shore Hospital.

Demographics and Social/Cultural Characteristics

Weymouth has a stable but diversifying population of 53,342 persons (2010 US Census). The Town ranks in the top 10 percent for total population in the state and the top 20 percent in population density. More than one fifth of residents are under age 18, another fifth are over age 59, and just under one third have a bachelor's degree or higher. About 11 percent of residents speak a language other than English at home. Since 2010, two census block groups have been designated by the state as Environmental Justice populations (i.e., 25 percent or more of inhabitants are classified as minorities). Weymouth is also a designated entitlement community under the federal Community Development Block Grant program. There are 12 low- or moderate-income neighborhoods in the Town, and about one out of 14 residents lives below the federal poverty line.

For the 2014-15 academic year, Weymouth Public Schools report 7,129 students enrolled in grades PK through 12. The Town's growing diversity is more pronounced within its schools. The proportion of minority students is 20.4 percent compared with just 11.9 percent in the general population. Between 2000 and 2014, the proportion of linguistically isolated students more than tripled. Arabic has exceeded Spanish as the second-most widely spoken language among English learners, with Portuguese ranking number one. In addition, more than one fifth of students are enrolled in public benefits programs.

Weymouth's popular recreation areas provide opportunities for year-round play and social activities. Great Hill Park and Webb Memorial State Park offer magnificent vistas across the Boston Harbor, and Great Esker Park along the Weymouth Back River is a regional destination for walking, jogging, bicycling, bird watching, kayaking, fishing, and boating. Swimmers can enjoy the Atlantic waters at George Lane Beach in the summer or visit the Connell Memorial Swimming Pool during the fall, winter, and spring.

Demographics and Social/Cultural Characteristics (continued)

For the community's most vulnerable groups, Weymouth runs a number of programs to help households achieve success. The Whipple Senior Center offers a continuum of services to assist the elderly, and the Teen Center provides adolescents with space to gather and socialize after school. Families in need can visit the Weymouth Food Pantry or consult Weymouth's Social Services Guide for access to essential services and financial assistance.

Settled in 1622, Weymouth has a rich history as the second oldest township in the Commonwealth. It is home to the birthplace of Abigail Adams, wife of U.S. President John Adams and mother of U.S. President John Quincy Adams. Remnants of each era of US history are evident in the very shape of the community, including its buildings, monuments, and roads. Notable landmarks include the First Church of Weymouth, the architecturally-significant Fogg Library and former Opera House, and the Historic Civic Center District encompassing the Town Hall, Cross of Grey, and Veteran's Memorial Wall. In less than seven years, Weymouth will celebrate its 400th anniversary.

Infrastructure and Public Transit

Unlike traditional New England townships, Weymouth has no single downtown center or business district. Development has concentrated around four separate village centers: Bicknell Square, Columbian Square, Jackson Square, and the Landing. Each village of Weymouth offers its own blend of historic buildings, land use, and green space. MBTA bus services run through all the centers, and Commuter Rail Stations are located within 1,000 feet of both Jackson Square and the Landing.

Highways in Weymouth include US Route 3, which bisects the Town, and three state highways: 3A, 18 and 53. MassDOT estimates that these roadways carry approximately 235,000 vehicles a day in and around Weymouth. The Town has a total of three MBTA Commuter Rail Stations with service along two rail lines: Greenbush and Kingston/Plymouth. Weymouth passengers can reach downtown Boston in under 30 minutes.

Local Business and Economic Characteristics

Weymouth has a sound business base anchored by several national retails stores operating along the Town's major arterials. An attractive office park abuts Route 3, taking advantage of its strategic location.

The dynamic reuse of previously developed land is a hallmark of Weymouth. This is best evidenced by the Stetson Place Medical Center, formerly the Stetson Shoe Company, and also Southfield, an evolving mixed-use neighborhood currently underway at the former Naval Air Station.

Local Business and Economic Characteristics (continued)

Weymouth's medical services district is the "medical Mecca" of the South Shore. The district is home to 23 buildings with more them 100 labs, physicians, specialists, and treatment centers. At the heart of the area is the South Shore Hospital, a 378-bed general medical and surgical facility and the lead regional provider of acute, emergency, maternity, and oncology care.

Weymouth has weathered economic downturns with poise in recent years. The local unemployment rate has remained on par or below the state's annual average since at least 2011, and the number of building permits for new construction has remained stable. Weymouth's median household income is higher than the state average, and most residents (42.3%) are employed in either education or health services. Weymouth households pay the lowest single-family tax rate in Norfolk County, and the Town's commercial tax rate is the lowest among all cities and towns within five miles of the Route I-93 (128) and Route 3 crossroads – Braintree, Milton, Quincy, Randolph, and Weymouth.

Summary of Municipal Energy Users

Table 1: Summary of Municipal Energy Users

	Number	Ownership
Buildings		
Oil Heat	2	Muni
Natural Gas Heat	33	Muni
Propane Heat	0	
Biomass Heat	0	
Other Heat Type	0	
Vehicles		
Non-Exempt	0	
Exempt	0	
Exempt	0	
Street Lights	3,918	Muni
Traffic Lights	2	Muni
Water and Sewer		
Drinking Water Treatment Plant	2	Muni
Wastewater Treatment Plant	1	Muni
Pumping Stations	14	Muni

Summary of Energy Use Baseline and Plans for Reductions

Table 2: Summary of Municipal Energy Use Baseline

BASELINE YEAR FY2015	MMBtu Used in Baseline Year	% of Total MMBtu Baseline Energy Consumption	Projected Planned MMBtu Savings	Savings as % of Total MMBtu Baseline Energy Consumption
Buildings	82,743	59%	19,673	24%
Vehicles	30,605	24%		
Street/Traffic Lights	14,092	11%	3,009	21%
Water/Sewer/ Pumping	8,497	6%	1,601	19%
Open Space	7			
Total	**136,307**	**100%**	**24,283**	**18%**

Energy Use Baseline Inventory

Inventory Tool Used

Mass Energy Insight (MEI) has been used for this ERP to inventory baseline energy usage. The following pages are screen shots of this breakdown by building, indicating both native fuel units and MMBTU:

ERP Guidance Table 3a - Municipal Energy Consumption for 2012, 2013, 2014, 2015 (Native Fuel Units)

		2012		2013		2014		2015				
		Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)	Oil (gallons)	Gasoline (gallons)	Diesel (gallons)
Building	Chapman Mid..	894,960	109,319	879,840	125,697	927,360	144,485	869,040	145,178			
	Seach Eleme..	168,016	6,380	173,184	25,125	180,831	18,543	182,751	20,445			
	Nash Elemen..	110,967	658	115,472	569	133,535	748	129,136	786			
	Murphy Elem..	88,408	23	103,891	23	105,371	23	90,290	26			
	Academy Ele..	201,800		204,360		228,280		224,560				
	Talbot Eleme..	93,252	266	106,169	259	98,263	262	105,503	264			
	Fire Station #5	68,520	1,131	77,720	5,487	74,720	6,125	79,880	6,893			
	Fire Station #2	67,182	6,277	68,993	6,942	77,582	6,648	76,597	7,216			
	Water Garage	4,078	1,210	4,751	6,999	5,345	7,726	5,541	8,402			
	Adams Middle	777,600	26	752,400	96	719,200	115	672,400	72	35,000		
	Pingree Elem..	133,644	2,938	134,695	17,844	134,128	20,755	138,128	21,983			
	Tufts Library	172,440	7,718	179,760	10,714	187,200	10,484	187,320	11,164			
	Fire Station #1	41,920	964	40,640	5,104	40,160	5,557	41,360	5,526			
	Fire Station #3	78,120	6,978	82,000	6,446	82,880	8,168	71,640	9,667			
	Wessagusset..	132,251	3,348	137,207	17,351	132,183	18,390	125,304	17,800			
	DPW Building	136,160	13,341	136,480	21,123	140,080	26,443	132,320	23,121			
	Johnson Ele..	104,373	5,522	107,821	35,817	104,295	34,773	102,333	43,417			
	School Admin..	51,622	2,976	47,103	3,649	45,284	3,961	48,666	4,737			
	Descisions Pr..	13,929	2,117	16,597	1,916	16,522	1,974	15,531	2,021			
	Fogg Library	6,055	270	2,696	5,468	22,982	3,705	46,770	2,360			
	Pratt Library	47,040		61,120		64,240		56,000				
	North Branch ..	15,606		15,678		16,289	3,230	16,386	3,237			
	Hamilton Ele..	156,532	622	146,809	595	150,303	905	148,143	841			
	Carpenters S..		3,042		3,469		4,217		4,403			
	Police Station..	550,000	12,846	545,600	16,226	528,200	19,252	551,000	17,473			
	Boat Ramp	2,992		2,523		2,678		2,453				
	Civil Defense	2,964		7,104		12,551		13,086				
	Teen Center	32,725	3,546	34,451	3,926	32,983	4,262	34,803	4,178			
	Town Hall	318,960		315,440	2,055	327,600	5,383	329,280	5,045			
	MF Storage	930		2,273		4,252		3,702				
	Emery Estate	4,944	488	10,560	3,006	11,101	3,360	7,894	3,914			
	Mc Culloch B..	115,040	62	124,880	56	114,640	54	117,680	70	9,005		
	WHS Maroon	1,169,600	69,111	1,104,800	74,210	1,124,400	82,661	1,111,600	80,850			
	WHS Gold	1,596,000	18,170	1,542,750	65,428	1,502,250	69,890	1,471,500	69,219			

ERP Guidance Table 3a - Municipal Energy Consumption for 2012, 2013, 2014, 2015 (Native Fuel Units)

		2012		2013		2014		2015				
		Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)	Electric (kWh)	Gas (therms)	Oil (gallons)	Gasoline (gallons)	Diesel (gallons)
Building	**Total**	**7,358,630**	**279,349**	**7,285,767**	**465,600**	**7,347,688**	**512,099**	**7,208,597**	**520,308**	**44,005**		
Street/Traffic Lights	Street Light P..	1,473,982		1,494,280		1,486,540		1,496,891				
	Former Dog ..	1,964		1,975		1,968		1,968				
	Traffic Signals	19,500		18,031		18,186		17,723				
	Memorial Wal..	10,759		11,786		8,450		6,381				
	School Street..	8,904		8,959		8,924		8,925				
	Security Light..	2,461,314		2,463,929		2,645,444		2,629,579				
	Total	**3,976,423**		**3,998,940**		**4,169,512**		**4,161,467**				
Vehicle	Diesel											46,000
	Gasoline										195,249	
	Total										**195,249**	**46,000**
Water/Sewer	WTP - 97 Win..		91		141		444		126			
	Pumping Stati..	217,816		479,684		293,595		313,290				
	WTP # 2 - 95 ..	341,200	11,868	393,000	14,636	380,000	18,501	428,600	15,679			
	Great Pond ..		6,448		32,289		29,360		13,834			
	Pumping Stati..	589,221	2,814	618,267	2,616	652,388	6,930	656,788	7,360			
	Water Tower	54		30		806		5,250				
	Total	**1,148,291**	**21,221**	**1,490,981**	**49,682**	**1,326,789**	**55,235**	**1,403,928**	**36,999**			
Grand Total		**12,483,344**	**300,570**	**12,775,688**	**515,282**	**12,843,989**	**567,334**	**12,773,992**	**557,307**	**44,005**	**195,249**	**46,000**

ERP Guidance Table 3b - Municipal Energy Consumption for 2012, 2013, 2014, 2015 (MMBTU)
Please make sure that any data submitted to DOER contains complete Data!

		2012			2013			2014			2015					
		Electric	Gas	Total	Electric	Gas	Total	Electric	Gas	Total	Diesel	Electric	Gas	Gasoline	Oil	Total
Building	Chapman Mid..	3,054	10,932	**13,986**	3,002	12,570	**15,572**	3,164	14,449	**17,613**		2,965	14,518			**17,483**
	Seach Eleme..	573	638	**1,211**	591	2,513	**3,103**	617	1,854	**2,471**		624	2,045			**2,668**
	Nash Elemen..	379	66	**444**	394	57	**451**	456	75	**530**		441	79			**519**
	Murphy Elem..	302	2	**304**	354	2	**357**	360	2	**362**		308	3			**311**
	Academy Ele..	689		**689**	697		**697**	779		**779**		766				**766**
	Talbot Eleme..	318	27	**345**	362	26	**388**	335	26	**361**		360	26			**386**
	Fire Station #5	234	113	**347**	265	549	**814**	255	613	**867**		273	689			**962**
	Fire Station #2	229	628	**857**	235	694	**930**	265	665	**930**		261	722			**983**
	Water Garage	14	121	**135**	16	700	**716**	18	773	**791**		19	840			**859**
	Adams Middle	2,653	3	**2,656**	2,567	10	**2,577**	2,454	12	**2,465**		2,294	7		4,865	**7,166**
	Pingree Elem..	456	294	**750**	460	1,784	**2,244**	458	2,076	**2,533**		471	2,198			**2,670**
	Tufts Library	588	772	**1,360**	613	1,071	**1,685**	639	1,048	**1,687**		639	1,116			**1,756**
	Fire Station #1	143	96	**239**	139	510	**649**	137	556	**693**		141	553			**694**
	Fire Station #3	267	698	**964**	280	645	**924**	283	817	**1,100**		244	967			**1,211**
	Wessagusset..	451	335	**786**	468	1,735	**2,203**	451	1,839	**2,290**		428	1,780			**2,208**
	DPW Building	465	1,334	**1,799**	466	2,112	**2,578**	478	2,644	**3,122**		451	2,312			**2,764**
	Johnson Ele..	356	552	**908**	368	3,582	**3,950**	356	3,477	**3,833**		349	4,342			**4,691**
	School Admin..	176	298	**474**	161	365	**526**	155	396	**551**		166	474			**640**
	Descisions Pr..	48	212	**259**	57	192	**248**	56	197	**254**		53	202			**255**
	Fogg Library	21	27	**48**	9	547	**556**	78	371	**449**		160	236			**396**
	Pratt Library	160		**160**	209		**209**	219		**219**		191				**191**
	North Branch ..	53		**53**	53		**53**	56	323	**379**		56	324			**380**
	Hamilton Ele..	534	62	**596**	501	60	**560**	513	91	**603**		505	84			**590**
	Carpenters S..		304	**304**		347	**347**		422	**422**			440			**440**
	Police Station..	1,877	1,285	**3,161**	1,862	1,623	**3,484**	1,802	1,925	**3,727**		1,880	1,747			**3,627**
	Boat Ramp	10		**10**	9		**9**	9		**9**		8				**8**
	Civil Defense	10		**10**	24		**24**	43		**43**		45				**45**
	Teen Center	112	355	**466**	118	393	**510**	113	426	**539**		119	418			**537**
	Town Hall	1,088		**1,088**	1,076	206	**1,282**	1,118	538	**1,656**		1,124	505			**1,628**
	MF Storage	3		**3**	8		**8**	15		**15**		13				**13**
	Emery Estate	17	49	**66**	36	301	**337**	38	336	**374**		27	391			**418**
	Mc Culloch B..	393	6	**399**	426	6	**432**	391	5	**397**		402	7		1,252	**1,660**
	WHS Maroon	3,991	6,911	**10,902**	3,770	7,421	**11,191**	3,836	8,266	**12,103**		3,793	8,085			**11,878**
	WHS Gold	5,446	1,817	**7,263**	5,264	6,543	**11,807**	5,126	6,989	**12,115**		5,021	6,922			**11,943**

ERP Guidance Table 3b - Municipal Energy Consumption for 2012, 2013, 2014, 2015 (MMBTU)
Please make sure that any data submitted to DOER contains complete Data!

		2012			2013			2014			2015					
		Electric	Gas	Total	Electric	Gas	Total	Electric	Gas	Total	Diesel	Electric	Gas	Gasoline	Oil	Total
Building	Total	**25,108**	**27,935**	**53,043**	**24,859**	**46,560**	**71,419**	**25,070**	**51,210**	**76,280**		**24,596**	**52,031**		**6,117**	**82,743**
Street/Traffic Lights	Street Light P..	5,029		**5,029**	5,098		**5,098**	5,072		**5,072**		5,107				**5,107**
	Former Dog ..	7		**7**	7		**7**	7		**7**		7				**7**
	Traffic Signals	67		**67**	62		**62**	62		**62**		60				**60**
	Memorial Wal..	37		**37**	40		**40**	29		**29**		22				**22**
	School Street..	30		**30**	31		**31**	30		**30**		30				**30**
	Security Light..	8,398		**8,398**	8,407		**8,407**	9,026		**9,026**		8,972				**8,972**
	Total	**13,568**		**13,568**	**13,644**		**13,644**	**14,226**		**14,226**		**14,199**				**14,199**
Vehicle	Diesel										6,394					**6,394**
	Gasoline													24,211		**24,211**
	Total										**6,394**			**24,211**		**30,605**
Water/Sewer	WTP - 97 Win..		9	**9**		14	**14**		44	**44**			13			**13**
	Pumping Stati..	743		**743**	1,637		**1,637**	1,002		**1,002**		1,069				**1,069**
	WTP # 2 - 95 ..	1,164	1,187	**2,351**	1,341	1,464	**2,805**	1,297	1,850	**3,147**		1,462	1,568			**3,030**
	Great Pond ..		645	**645**		3,229	**3,229**		2,936	**2,936**			1,383			**1,383**
	Pumping Stati..	2,010	281	**2,292**	2,110	262	**2,371**	2,226	693	**2,919**		2,241	736			**2,977**
	Water Tower	0		**0**	0		**0**	3		**3**		18				**18**
	Total	**3,918**	**2,122**	**6,040**	**5,087**	**4,968**	**10,055**	**4,527**	**5,524**	**10,051**		**4,790**	**3,700**			**8,490**
Grand Total		**42,593**	**30,057**	**72,650**	**43,591**	**51,528**	**95,119**	**43,824**	**56,733**	**100,557**	**6,394**	**43,585**	**55,731**	**24,211**	**6,117**	**136,037**

Baseline Year and ERP Timeframe

The Town's baseline year is FY2015. The five-year timeframe for the 20 percent energy reduction goal is FY2016-FY2020.

Energy Reduction Plan

Weymouth has historically implemented energy saving measures through working with ECI and utilizing National Grid programs over the past fifteen years, including lighting replacements in most buildings, dry-type transformer replacements, and the installation of new motors and variable speed drives on most mechanical systems. We look to continue and expand on our successful working relationships with both companies over the next five years. The baseline year of FY2015 was chosen, so FY2016 would be a logical period to initiate implementation of the proposed measures.

Energy improvements over the next five years include the retrofitting of existing fluorescent lighting systems with new utility-qualified LED systems. National Grid will pay incentives only on LED products qualified by the Design Lights Consortium (DLC) (see https://www.designlights.org/). These products have been qualified through heat testing and lumen output testing according to standards established by the Illumination Engineering Society of North America (IESNA – see http://www.ies.org/). National Grid also offers 0 percent financing on the net cost to the Town, after incentives, for a two-year period.

The School Department has also written an active behavioral policy instructing all personnel to conserve energy by shutting off lighting and peripheral equipment and shutting windows – for an estimated 2 percent savings in energy costs. Weatherization measures are also planned on most buildings. As is typical with older buildings due to settling and the effects of variations in temperature and humidity over the years, many of the Town's buildings are in need of tightening up of the thermal barriers of the structures for energy savings and building comfort. Motor and VFD improvements have been implemented in school buildings, and there are opportunities at the Water Department facilities for improvements that are included in this ERP. Replacement of existing high intensity discharge (HID) street lights is also included in this ERP. Installation of a new energy management system at the Town Hall is further planned to replace a thermostat and timer system which are currently in place.

Overview of Goals for Years 1-3

The first three years of the energy plan include:

- Replacement of inefficient #2 oil-fired boiler systems in the Abigail Adams Middle School with new natural gas-fired boilers with fuel switching.
- Weatherization of School and Municipal buildings.
- Replacement of inefficient motors and the installation of VFDs at:
    - Libbey Pumping Station
    - Tufts Library
    - Winter Street Water Treatment facility
- Replacement of street lighting with new LED technology street lights.
- Interior lighting retrofits of existing optically-inefficient lighting systems to LED technology in both school and municipal buildings.
- Implement the School Department's behavioral policy throughout all schools to conserve energy through turning off equipment and closing windows.

Overview of Goals for Years 4-5

Years four and five of the energy plan include:

- Replacement of inefficient boiler systems in the DPW Building.
- Weatherization of school and municipal buildings.
- Installation of an energy management system (EMS) at Town Hall.
- Installation of VFDs at the Great Pond Water Treatment Plant.
- Replacement of inefficient #2 oil-fired boiler systems in the DPW Building with new natural gas-fired boilers with fuel switching.
- Replacement of an inefficient boiler system in the Tufts Library with new efficient boiler system.

Areas of Least Efficiency/Greatest Waste

Most of the Town's buildings are in good shape electrically – lighting systems are candidates for upgrade to LED improvements and currently have the most efficient fluorescent lighting technologies through improvements made through the utility programs over the last several years. HVAC control systems in most buildings consist of individual thermostats, and facility operators are actively and successfully managing thermostat settings and exterior lighting time clocks. Some of the buildings still have older boilers that are slated for replacement through projected capital improvement projects. Two of these projects are included in this five-year plan.

Area of Least Efficiency/Greatest Waste (continued)

One of the largest inefficiencies throughout the buildings, and is a common problem amongst most buildings in other cities and towns of the same age, is envelope openings. Weatherization measures included in this plan will minimize loss due to infiltration and general air leaks throughout the buildings. An added benefit of weatherization is attention to an all-around safety check. Many buildings receiving attention are older and in need of repair. Weatherization service providers check major energy systems to ensure occupant safety.

Getting to a 20% Energy Use Reduction within 5 Years

The measures identified in this plan are straightforward and may be implemented within the indicated periods without interfering operationally in each building. Improvements will be completed after hours so as not to interfere with daily activities. School improvements are more easily implemented over the summer vacation period. Street lighting improvements have been researched with National Grid and all planning regarding safety concerns and traffic scheduling have been addressed.

Savings beyond the projected 18 percent over the five-year period are realistic in that additional measures will be identified that are outside the normal scope of the improvements that have been planned. As mechanical systems may need repair or replacement during this period, for example, more efficient systems will be designed and installed to replace the older ones.

Personnel involved with this ERP's implementation and oversight will include the Facility Directors of both the DPW and School Department. ECI will have Project Managers coordinate all project installations with the Facility Directors. Reporting will be coordinated between ECI and the Facility Directors.

Table 4: Energy Conservation Measures Data

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Table 4
SAMPLE Energy Conservation Measures Data

ECMs			Status		Energy Data						Financial Data					Reference Data	
Category/Building Name	Energy Conservation Measure Name	ECM Type (select one from drop-down)	Status (select one from drop-down)	Status Date (Completed with month/year or planned Qtr/year)	Projected Annual Electricity Savings (kWh)	Projected Annual Natural Gas Savings (therms)	Projected Annual Oil Savings (gallons)	Projected Annual Propane Savings (gallons)	Projected Annual Gasoline Savings (gallons)	Projected Annual Diesel Savings (gallons)	Projected Annual Cost Savings ($)	Total Installed Cost ($)	Green Community Grant ($)	Utility Incentives ($)	Net Cost ($)	Funding Source(s) for Net Costs	Source for Projected Savings
Abigail Adams School - boiler replacements - fuel switching (#2 oil-to-natural gas)	ECM1	HVAC	Planned	Jun-16	0	0	7,755	0	0	0	$0	$0	$0	$0	$0	0	McKinnel, McKinnel & Taylor savings estimate, dated 11/9/2015
Chapman Middle School	ECM2	Weatherization	Planned	Jun-16	2,535	16,276	0	0	0	0	$27,684	$181,202	$181,202	$0	$0	0	Energy Conservation audit 2015
Tufts Library	ECM3	Weatherization	Planned	Jun-16	2,509	1,525	0	0	0	0	$16,661	$40,882	$40,882	$0	$0	0	Energy Conservation audit 2015
Great Pond Water Treatment Plant	ECM4	Weatherization	Planned	Jun-16	199	521	0	0	0	0	$624	$6,777	$6,777	$0	$0	0	Energy Conservation audit 2015
Fire Station #3	ECM5	Weatherization	Planned	Jun-16	2,853	1,970	0	0	0	0	$2,702	$29,963	$29,963	$0	$0	0	Energy Conservation audit 2015
High School	ECM6	Weatherization	Planned	Jun-16	6,834	12,593	0	0	0	0	$15,575	$145,641	$145,641	$0	$0	0	Energy Conservation audit 2015
Libbey Pumping Station	ECM7	Pump/Motor/Drive	Planned	Jun-17	111,552	0	0	0	0	0	$16,733	$90,650	$16,684	$40,500	$33,466	Financed through National Grid	Energy Conservation audit 2015
Fire Station #5	ECM8	Weatherization	Planned	Jun-17	3,225	2,117	0	0	0	0	$2,993	$25,167	$25,167	$0	$0	0	Energy Conservation audit 2015
Fire Station #1	ECM9	Weatherization	Planned	Jun-17	2,845	2,159	0	0	0	0	$2,916	$40,594	$40,594	$0	$0	0	Energy Conservation audit 2015
Fire Station #2 - Headquarters	ECM10	Weatherization	Planned	Jun-17	1,866	1,289	0	0	0	0	$1,712	$19,424	$19,424	$0	$0	0	Energy Conservation audit 2015
Winter Street Water Treatment Plant	ECM11	Weatherization	Planned	Jun-17	162	2,244	0	0	0	0	$2,576	$32,022	$32,022	$0	$0	0	Energy Conservation audit 2015
Town Hall	ECM12	Interior Lighting	Planned	Jun-17	66,022	0	0	0	0	0	$9,157	$42,920	$15,306	$9,300	$18,314	Financed through National Grid	Energy Conservation audit 2015
High School	ECM13	Interior Lighting	Planned	Jun-17	466,809	0	0	0	0	0	$74,103	$328,020	$69,376	$110,438	$148,206	Financed through National Grid	Energy Conservation audit 2015
Johnson School	ECM14	Weatherization	Planned	Jun-17	203	1,305	0	0	0	0	$1,455	$15,607	$15,607	$0	$0	0	Energy Conservation audit 2015
Tufts Library	ECM15	Pump/Motor/Drive	Planned	Jun-17	14,381	0	0	0	0	0	$2,013	$15,113	$4,187	$6,900	$4,026	Financed through National Grid	Energy Conservation audit 2015
Winter Street Water Treatment Plant	ECM16	Pump/Motor/Drive	Planned	Jun-17	181,726	0	0	0	0	0	$25,442	$152,619	$53,435	$48,300	$50,884	Financed through National Grid	Energy Conservation audit 2015
Johnson School	ECM17	Interior Lighting	Planned	Jun-17	45,474	0	0	0	0	0	$7,281	$41,223	$15,911	$10,750	$14,562	Financed through National Grid	Energy Conservation audit 2015
Nash School	ECM18	Interior Lighting	Planned	Jun-17	49,386	0	0	0	0	0	$7,907	$52,042	$19,165	$17,063	$15,814	Financed through National Grid	Energy Conservation audit 2015
Pingree School	ECM19	Interior Lighting	Planned	Jun-17	42,786	0	0	0	0	0	$6,326	$45,777	$18,200	$14,925	$12,652	Financed through National Grid	Energy Conservation audit 2015
Recreation Center	ECM20	Weatherization	Planned	Jun-17	1,750	1,648	0	0	0	0	$2,597	$18,235	$18,235	$0	$0	0	Energy Conservation audit 2015
Street Lights	ECM21	Exterior Lighting	Planned	Jun-18	881,748	0	0	0	0	0	$87,219	$1,941,354	$1,546,479	$220,437	$174,438	0	Energy Conservation audit 2015
Murphy School	ECM22	Interior Lighting	Planned	Jun-18	42,786	0	0	0	0	0	$6,174	$46,522	$18,785	$15,389	$12,348	Financed through National Grid	Energy Conservation audit 2015
Police Station	ECM23	Weatherization	Planned	Jun-18	5,865	5,830	0	0	0	0	$3,297	$35,336	$35,336	$0	$0	0	Energy Conservation audit 2015
Wessagusett School	ECM24	Interior Lighting	Planned	Jun-18	34,206	0	0	0	0	0	$5,256	$39,218	$17,556	$11,150	$10,512	Financed through National Grid	Energy Conservation audit 2015
Pingree School	ECM25	Weatherization	Planned	Jun-18	196	1,257	0	0	0	0	$1,462	$25,106	$25,106	$0	$0	0	Energy Conservation audit 2015
Fire Station #2 - Headquarters	ECM26	Interior Lighting	Planned	Jun-18	17,279	0	0	0	0	0	$2,246	$17,594	$8,102	$5,000	$4,492	Financed through National Grid	Energy Conservation audit 2015
Seach School	ECM27	Interior Lighting	Planned	Jun-18	37,396	0	0	0	0	0	$5,656	$47,232	$21,298	$14,622	$11,312	Financed through National Grid	Energy Conservation audit 2015
Great Pond Water Treatment Plant	ECM28	Interior Lighting	Planned	Jun-18	33,406	0	0	0	0	0	$4,332	$42,494	$20,230	$13,600	$8,664	Financed through National Grid	Energy Conservation audit 2015
Franklin Pratt Library	ECM29	Interior Lighting	Planned	Jun-18	3,684	0	0	0	0	0	$1,552	$14,910	$6,806	$5,000	$3,104	Financed through National Grid	Energy Conservation audit 2015
Winter Street Water Treatment Plant	ECM30	Interior Lighting	Planned	Jun-18	10,038	0	0	0	0	0	$1,104	$10,437	$4,929	$3,300	$2,208	Financed through National Grid	Energy Conservation audit 2015
DPW Building	ECM31	Interior Lighting	Planned	Jun-18	27,065	0	0	0	0	0	$3,595	$31,609	$16,169	$8,250	$7,190	Financed through National Grid	Energy Conservation audit 2015
Police Station	ECM32	Interior Lighting	Planned	Jun-18	59,971	0	0	0	0	0	$7,398	$60,535	$33,989	$11,750	$14,796	Financed through National Grid	Energy Conservation audit 2015
Tufts Library	ECM33	Interior Lighting	Planned	Jun-19	98,280	0	0	0	0	0	$13,759	$118,818	$71,425	$19,875	$27,518	Financed through National Grid	Energy Conservation audit 2015
Schools Administration Building	ECM34	Interior Lighting	Planned	Jun-19	9,880	0	0	0	0	0	$1,378	$15,425	$8,041	$4,628	$2,756	Financed through National Grid	Energy Conservation audit 2015
Talbot School	ECM35	Interior Lighting	Planned	Jun-19	32,624	0	0	0	0	0	$4,567	$52,982	$27,424	$16,424	$9,134	Financed through National Grid	Energy Conservation audit 2015
Chapman Middle School	ECM36	Interior Lighting	Planned	Jun-19	303,545	0	0	0	0	0	$42,553	$487,224	$201,878	$200,240	$85,106	Financed through National Grid	Energy Conservation audit 2015
McCulloch Building	ECM37	Interior Lighting	Planned	Jun-19	30,165	0	0	0	0	0	$4,268	$47,350	$27,764	$11,050	$8,536	Financed through National Grid	Energy Conservation audit 2015
Academy Avenue School	ECM38	Weatherization	Planned	Jun-19	373	2,397	0	0	0	0	$2,777	$27,689	$27,689	$0	$0	0	Energy Conservation audit 2015
Nash School	ECM39	Weatherization	Planned	Jun-19	403	2,454	0	0	0	0	$2,862	$29,766	$29,766	$0	$0	0	Energy Conservation audit 2015
Hamilton School	ECM40	Interior Lighting	Planned	Jun-19	31,460	0	0	0	0	0	$4,403	$64,560	$34,104	$21,650	$8,806	Financed through National Grid	Energy Conservation audit 2015
Recreation Center	ECM41	Interior Lighting	Planned	Jun-20	5,220	0	0	0	0	0	$940	$13,568	$7,488	$4,200	$1,880	Financed through National Grid	Energy Conservation audit 2015
North Branch Library	ECM42	Interior Lighting	Planned	Jun-20	6,713	0	0	0	0	0	$1,141	$16,103	$10,621	$3,200	$2,282	Financed through National Grid	Energy Conservation audit 2015
Decisions School	ECM43	Interior Lighting	Planned	Jun-20	6,829	0	0	0	0	0	$1,169	$17,815	$12,227	$3,250	$2,338	Financed through National Grid	Energy Conservation audit 2015
Decisions School	ECM44	Weatherization	Planned	Jun-20	76	761	0	0	0	0	$698	$6,903	$6,903	$0	$0	0	Energy Conservation audit 2015
Talbot School	ECM45	Weatherization	Planned	Jun-20	393	2,528	0	0	0	0	$2,937	$31,428	$31,428	$0	$0	0	Energy Conservation audit 2015
Town Hall	ECM46	Building Control	Planned	Jun-20	22,900	189	0	0	0	0	$6,046	$70,252	$52,252	$18,000	$0	0	Energy Conservation audit 2015
Town Hall	ECM47	Weatherization	Planned	Jun-20	3,508	2,847	0	0	0	0	$3,702	$45,312	$45,312	$0	$0	0	Energy Conservation audit 2015
DPW Building	ECM48	Weatherization	Planned	Jun-20	1,616	6,552	0	0	0	0	$7,679	$85,708	$85,708	$0	$0	0	Energy Conservation audit 2015
Murphy School	ECM49	Weatherization	Planned	Jun-20	100	641	0	0	0	0	$747	$10,059	$10,059	$0	$0	0	Energy Conservation audit 2015
Great Pond Water Treatment Plant	ECM50	Pump/Motor/Drive	Planned	Jun-20	132,108	0	0	0	0	0	$19,816	$75,590	$2,958	$33,000	$39,632	Financed through National Grid	Energy Conservation audit 2015
DPW Building - boiler replacements	ECM51	HVAC	Planned	Jun-20	0	0	3,302	0	0	0	$0	$0	$0	$0	$0		McKinnel, McKinnel & Taylor savings estimate, dated 11/9/2015
Tufts Library - boiler replacements	ECM52	HVAC	Planned	Jun-20	0	1,777	0	0	0	0	$2,198	$0	$0	$0	$0		McKinnel, McKinnel & Taylor savings estimate, dated 11/23/2015
All Schools	ECM53	Behav & Training	Planned	Jun-16	0	21,153	1,820	0	0	0	$26,163	$0	$0	$0	$0		Schools Behavioral Energy Conservation Policy, dated September 6, 2015
		TOTAL Projected Savings			2,842,950	92,034	12,878	0	0	0	$477,191	$4,852,777	$3,215,610	$902,191	$734,976		
		TOTAL MMBtu SAVINGS	24,283		9,700	12,793	1,790	0	0	0							