Investment Grade Audit

for the City of South Portland

LED Streetlighting Conversion

July 26, 2018

O-0822 - P-0663

Primary Contact

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REALTERM ENERGY

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City of South Portland
496 Ocean Street
South Portland
ME 04116-9422

Dear Mr. L'Heureux

We are pleased to present this Investment Grade Audit of the streetlight network for the City of South Portland.

We have concluded our detailed analysis of your streetlight system to reflect the proposed upgrade to LEDs based on our GIS/GPS mapping. The upgrade of the existing streetlights to LEDs under the scope of work of this IGA will reduce overall operating costs by 80% in the first year.

The total project cost is $1,646,098 (inclusive of a 10% contingency) and includes the allowances for rewiring, fusing, arm replacement and other installation allowances listed in Section 6.2 - Allowances. The estimated available incentives are $14,000 from Efficiency Maine. In addition, we have included a project specific appendix that depicts the estimated added cost in including smart controls

We look forward to moving your project to the next phase. We will arrange for a conference call to discuss the contents of this report in the next few days, but until then please feel free to contact us should you have any questions.

Yours truly,

Sean Neely, President
sneely@realtermenergy.com

1. EXECUTIVE SUMMARY

Technical / Environmental Assessment	Title	City of South Portland LED Streetlight Conversion
	Baseline	Qty HID(1) Cobrahead Fixtures: 1,490 Qty HID Decorative/Flood Fixtures: 344 Total Demand (kW): 266.8 Annual Operating Hours: 4,260 Annual Energy Consumption (kWh): 1,136,568
	Technology Employed	Smart ready LED Fixtures
	Technology Provider(s)	Cree (cobrahead fixtures), Acuity Brands (decorative fixtures)
	Technical Specifications	7-PIN, Smart ready fixtures Color temp: 3,000K, Average life ≥ 100,000 hours CRI ≥70, IP ≥ IP 65
	Fixture Warranty	10 years
	Annual Operating Cost Savings	$279,583 (80%)
Financial Assessment	Financing Scheme	Capital Purchase (South Portland-financed)
	Project Cost	**$1,496,453**
	Project Contingency (10%)	$149,645
	Project Cost with Contingency	$1,646,098
	Acquisition Cost from CMP	$213,281
	Total Project Cost	**$1,859,379**
	Incentive from Efficiency Maine	($14,000)
	Net Project Cost	**$1,845,379**
	Net Price per Fixture	$1,011
	Project Reference Period	23 Years
	Payback Period	5.6 Years (Excluding Contingency) 6.1 Years (Including Contingency)

(1) – High Intensity Discharge

2. GPS MAPPING

RealTerm Energy conducted a complete GIS inventory of the City of South Portland's streetlights and used the information derived from this review to develop a detailed picture of South Portland's current streetlighting network which includes the following:

- Accurate count of all fixtures and fixture types
- Wattage of each existing fixture
- Length of fixture arms, fixture heights, setbacks from roadway, pole spacing, etc.
- Exact GPS coordinates
- Road classifications
- Utility pole ID numbers (when available)

From this data, we established a profile of South Portland's streetlight inventory and defined key parameters such as demand and energy consumption. This then allowed us to accurately estimate energy savings potential associated with the LED upgrade.

A detailed breakdown of the revised lighting inventory, obtained from the GIS/GPS audit is presented below:

2.1. GPS Inventory (Actual)

UTILITY	TYPE	WATTAGE	QTY	DEMAND (kW)
COBRAHEAD FIXTURES				
CMP	Cobrahead - HPS - 50W	65	655	42.6
CMP	Cobrahead - HPS - 70W	95	214	20.3
CMP	Cobrahead - HPS - 100W	130	254	33.0
CMP	Cobrahead - HPS - 150W	195	160	31.2
CMP	Cobrahead - HPS - 250W	300	137	41.1
CMP	Cobrahead - HPS - Shoe Box - 250W	300	25	7.5
CMP	Cobrahead - HPS - 400W	465	4	1.9
CMP	Cobrahead - HPS - Shoe Box - 400W	465	35	16.3
CMP	(Remove Only) Cobrahead - HPS - 50W	65	2	0.1
CMP	(Remove Only) Cobrahead - HPS - 70W	95	4	0.4
Subtotal			**1490**	**194.4**
DECORATIVE/FLOOD/AREA FIXTURES				
CMP	Decorative - Acorn Post Top - 100W	130	16	2.1
CMP	Decorative - Bell Downlighting - 100W	130	3	0.4
CMP	Decorative - Box Top - 100W	130	3	0.4
CMP	Decorative - Box Top - 175W	210	16	3.4
CMP	Decorative - Box Top - 200W	250	14	3.5
CMP	Decorative - Box Top - 250W	300	17	5.1
CMP	Decorative - Box Top - 320W	370	19	7.0

CMP	Decorative - Box Top - 400W	465	11	5.1
CMP	Decorative - Box Top - 70W	95	2	0.2
CMP	Decorative - Other - 175W	210	20	4.2
CMP	Decorative - Other - 250W	300	38	11.4
CMP	Decorative - Other - 70W	95	28	2.7
CMP	Decorative - Tear Drop Downlighting - 100W	130	2	0.3
CMP	Decorative - Victorian Lantern Post Top - 100W	130	121	15.7
CMP	Decorative - Victorian Lantern Post Top - 150W	195	2	0.4
CMP	Floodlight - 100W	130	2	0.3
CMP	Floodlight - 250W	300	13	3.9
CMP	Floodlight - 400W	465	13	6.0
CMP	(Remove Only) Floodlight - 100W	130	1	0.1
CMP	(Remove Only) Floodlight - 250W	300	1	0.3
Subtotal			**342**	**72.4**
TOTAL			**1832**	**266.8**

Notes: Following Photometric designs, eight (8) if the above lights (6 Cobrahead and 2 Floodlights) were noted as suggested remove-only and are included in the scope of work outlined in this IGA report.
Remove Only Cobrahead RTE_ID: 529, 721, 1345, 1447, 1462, 1466.
Remove Only Floodlight RTE_ID: 2071, 2107.

3. LED REPLACEMENT INVENTORY

The table below illustrates the proposed changes to South Portland's inventory, based on our analysis of the GIS data and lighting design results (see next page for more details on our design methodology).

Following input from the Municipality, our design team developed photometric design plans utilizing 3000K color temperature. The 3000K fixtures will be deployed in order to ensure resident comfort without compromising safety. This color temperature was selected as part of the Municipality's pilot project.

3.1. LED Replacements (Actual, Post-Upgrade)

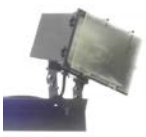
UTILITY	TYPE	WATTAGE	QTY	DEMAND (kW)	DLC*	COLOUR-TEMP.
COBRAHEAD LUMINAIRES						
CMP	17W_RSWS-A-HT-2LG-3L-30K7-UL-GY-N-Q2	17	394	6.7	DLC	3000K
CMP	17W_RSWS-A-HT-3ME-3L-30K7-UL-GY-N-Q2	17	2	0.0	DLC	3000K
CMP	23W_RSWS-A-HT-2LG-3L-30K7-UL-GY-N-Q3	23	435	10.0	DLC	3000K
CMP	23W_RSWS-A-HT-3ME-3L-30K7-UL-GY-N-Q3	23	23	0.5	DLC	3000K
CMP	45W_RSWS-A-HT-2LG-5L-30K7-UL-GY-N-Q4	45	230	10.4	DLC	3000K
CMP	45W_RSWS-A-HT-2LG-5L-30K7-UL-GY-N-Q4_BLSS	45	8	0.4	DLC	3000K
CMP	62W_RSWM-A-HT-2LG-9L-30K7-UL-GY-N-Q3	62	26	1.6	DLC	3000K
CMP	83W_RSWM-A-HT-2LG-9L-30K7-UL-GY-N-Q8	83	32	2.7	DLC	3000K
CMP	83W_RSWM-A-HT-2LG-9L-30K7-UL-GY-N-Q8_BLSS	83	1	0.1	DLC	3000K
CMP	83W_RSWM-A-HT-3ME-9L-30K7-UL-GY-N-Q8	83	78	6.5	DLC	3000K
CMP	83W_RSWM-A-HT-3ME-9L-30K7-UL-GY-N-Q8_BLSS	83	26	2.2	DLC	3000K
CMP	99W_BXSP1-HO-HT-3ME-100W-30K-UL-SV-N-Q9	99	34	3.4	DLC	3000K
CMP	112W_BXSP2-HO-HT-3ME-160W-30K-UL-SV-N-Q5	112	97	10.9	DLC	3000K
CMP	112W_BXSP2-HO-HT-3ME-160W-30K-UL-SV-N-Q5_AVPL-SA-1-238X8IN OAL-PT4.5IN (OD EXISTING POLE)-STD FINISH	112	51	5.7	DLC	3000K
CMP	125W_BXSP2-HO-HT-3ME-160W-30K-UL-SV-N-Q6	125	44	5.5	DLC	3000K
CMP	125W_BXSP2-HO-HT-3ME-160W-30K-UL-SV-N-Q6_PT-1HSV	125	3	0.4	DLC	3000K
Subtotal			**1,484**	**66.8**		

DECORATIVE/FLOOD/AREA LUMINAIRES						
CMP	25W_ATB0-10BLEDE70-MVOLT-R3-3K-BZ-MP-NL-UMS-BZ-P7	25	33	0.8	DLC Premium	3000K
CMP	27W_MSPL2-P10-30K-AS-S-W-7-SS-P7E-NL1X1_CR30/1-CA/WH-QSM/P7 RFD278816	27	2	0.1	DLC	3000K
CMP	27W_MSPL2-P10-30K-AS-S-W-7-SS-P7-NL1X1-BHDF13 200 WH_SG20/1-CA/WH	27	3	0.1	DLC	3000K
CMP	36W_ATB0-20BLEDE53-MVOLT-R4-3K-BK-MP-NL-UMS-BK-P7	36	6	0.2	DLC Premium	3000K
CMP	36W_ATB0-20BLEDE53-MVOLT-R4-3K-BZ-MP-NL-UMR-BZ-P7	36	16	0.6	DLC Premium	3000K
CMP	36W_ATB0-20BLEDE53-MVOLT-R4-3K-BZ-MP-NL-UMS-BZ-P7	36	34	1.2	DLC Premium	3000K
CMP	39W_247CL-10LEDE10-MVOLT-3K-R2-P7-NL	39	3	0.1	No	3000K
CMP	39W_247CL-10LEDE10-MVOLT-3K-R2-P7-NL-HSS	39	14	0.5	No	3000K
CMP	39W_247CL-10LEDE10-MVOLT-3K-R3-P7-NL	39	64	2.5	No	3000K
CMP	39W_247CL-10LEDE10-MVOLT-3K-R3-P7-NL-HSS	39	41	1.6	No	3000K
CMP	39W_247CL-10LEDE10-MVOLT-3K-R5-P7-NL	39	3	0.1	No	3000K
CMP	39W_GVD2-P20-30K-AS-M-BK-3-N-S-BK-P7-NL1X1_Extended set screws	39	10	0.4	DLC	3000K
CMP	39W_GVD2-P20-30K-AS-M-GN-3-N-S-GN-P7-NL1X1_Extended set screws	39	6	0.2	DLC	3000K
CMP	48W_ATB0-20BLEDE70-MVOLT-R3-3K-BZ-MP-NL-UMS-BZ-P7	48	42	2.0	DLC Premium	3000K
CMP	48W_ATB0-20BLEDE70-MVOLT-R4-3K-BZ-MP-NL-UMS-BZ-P7	48	7	0.3	DLC Premium	3000K
CMP	49W_ACP0LED-PK1-MVOLT-MFL-30K-TM-BZSDP-10KVMP-PER7-NL	49	1	0.05	DLC Premium	3000K
CMP	71W_ATB0-20BLEDE10-MVOLT-R4-3K-BZ-MP-NL-UMS-BZ-P7	71	30	2.1	DLC Premium	3000K
CMP	79W_ACP0LED-PK2-MVOLT-WFL-30K-YK-BZSDP-10KVMP-PER7-06-23-NL	79	2	0.2	DLC Premium	3000K
CMP	79W_ACP0LED-PK2-MVOLT-WFL-30K-YK-GYSDP-10KVMP-PER7-06-23-NL	79	1	0.1	DLC Premium	3000K
CMP	119W_ACP0LED-PK3-MVOLT-WFL-30K-YK-GYSDP-10KVMP-PER7-06-23-NL	119	24	2.9	DLC	3000K
Subtotal			**342**	**16.1**		
TOTAL			**1,826**	**82.9**		
Notes: The Post-upgrade total fixture count differs from the baseline due to the remove-only of 8 fixtures and the addition of 2 new LED Post Top Decorative Luminaires to be installed on existing Decorative Poles. New Decorative Post Tops RTE_ID 10207 & 10304.						

*DLC-listed products are LED products that have been tested at a DLC-approved laboratory and comply with specified performance and energy efficiency criteria. These products in general are eligible for incentive programs. For further information please visit the DesignLights Consortium website at www.designlights.org. Please note, only DLC Premium-listed LED luminaires mounted on non-utility poles are eligible for Efficiency Maine's Commercial and Industrial (C&I) Prescriptive Incentive Program.

3.2. Site Specific Fixture Replacements

Type	Qty.	Replacement	Before	After
Cobrahead	1,092	RSWS CREE		
Cobrahead	163	RSWM CREE		
Cobrahead	34	BXSP1 CREE		
Cobrahead	135	BXSP2 CREE		
Shoe Box	60	BXSP2 CREE		
Cobrahead	6	Suggested Remove Only		Remove Only (RTE_ID: 529, 721, 1345, 1447, 1462, 1466)
Shoe Box	168	ATB0 Acuity Brands		

Post Top Decorative	123	247CL Acuity Brands		
New Light	2	247CL Acuity Brands	N/A - New Light (RTE_ID 10207, 10304)	
Teardrop Decorative	5	MSPL2 Acuity Brands		
Floodlight	28	ACP0 Acuity Brands	 	
Acorn Decorative	16	GVD2 Acuity Brands		
Floodlight / Shoebox	2	Suggested Remove Only		Remove Only (RTE_ID: 2071, 2107)

Note: *The images above are for illustration purposes only.*

4. LED LIGHTING DESIGN

RealTerm Energy's technical evaluation team reviewed the collected geospatial dataset and formulated a hybrid approach to completing the roadway designs for South Portland. After evaluating the configuration of each light fixture for road classification, pedestrian activity, pole spacing, mounting height, arm length and curb setback, we have concluded that South Portland can achieve the same or better lighting levels as those under its current streetlights. We have implemented a design solution of selected LED luminaires that follow the RP-8-2014 recommendations where possible, within the existing infrastructure configuration (RP-8 is a recommended, though not a required practice for roadway illumination).

The reason that a portion of South Portland's luminaires do not meet RP-8 may be due to several factors, including:

- Inadequate pole spacing (poles are spaced too far apart), or
- Missing light fixtures (at essential locations to eliminate gaps).

Our analysis concludes that in all instances where RP-8 could not be achieved with a new LED fixture, this was already the case for the existing fixture. In such instances, photometric design has been utilized to select an LED luminaire for which the wattage and distribution pattern combine to meet or exceed the existing lighting levels.

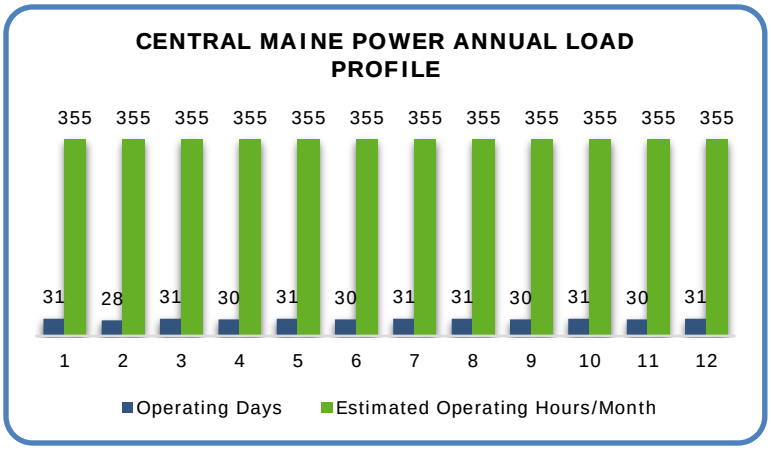
Based on the replacement luminaires detailed in the following pages, we anticipate that the impact on the City's annual energy consumption will be as follows:

PARAMETER	IGA Results	%
Current Annual Energy Consumption (kWh)	1,136,568	
Projected LED Annual Energy Consumption (kWh)	353,048	-
Annual Savings (kWh)	783,521	69%

5. OPERATING COST SAVINGS ANALYSIS

5.1. Central Maine Power's Load Profile

Streetlights are generally not metered, but rather deemed to be 'on' and are therefore billed based on a load profile, determined by the utility company. The annual load profile is a critical part of the baseline calculation, used to project the actual energy consumption and future energy savings that will be realized after the upgrade. The load profile utilized by Central Maine Power, South Portland's utility company, appears on the right. These hours are applicable to Central Maine Power's tariff structure, SL-Full Service Lighting (baseline) and SL-Delivery-Only Service Lighting (post-upgrade). For the City-owned portion of the inventory the yearly operating hours were assumed to be the same as the CMP Tariff hours depicted in the Annual Load Profile above.



5.2. Utility Rate Summary

The electricity cost savings were calculated based on Central Maine Power current rates[1] valid at the date of the preparation of this IGA. The annual energy and cost savings associated with the new LED streetlighting system were calculated taking into consideration both existing and proposed LED inventories. Any modifications in the data outlined in Section 2.1 of this IGA report might impact the energy consumption and cost savings. The table below summarizes the approach used to calculate the baseline and post-upgrade operating costs.

Item	Baseline		Post-Upgrade	
Number of Fixtures	1,622	210	1,617	209
	Total: 1,832		Total: 1,826	
Fixture Ownership	CMP	City	City	City
Tariff	SL-Full Service Lighting	Metered (Delivery: $0.059608/kWh)	SL-Delivery-Only Service Lighting	Metered (Delivery: $0.059608/kWh)
Supply Rate	0.0540/kWh	$0.079206/kWh	0.0540/kWh	$0.079206/kWh
Annual Inflation Rates	Energy (3%), Maintenance (2%)			

Based on bills provided, the City-owned portion of the baseline inventory was calculated as being metered as per the rates depicted on the bills provided. Accordingly, the LED replacement of these fixtures are also assessed as being metered. The change in fixture counts are due to the removal of (8) HID fixtures and the addition of (2) new LED Decoratives.

[1] Central Maine Power Tariff. Retrieved July 2018 from: https://www.cmpco.com/YourHome/pricing/pricingSchedules/default.html

5.3. Maintenance

The table below summarizes the baseline and post-upgrade LED maintenance cost that the City can expect:

Yearly Maintenance Cost		
Ownership	**Baseline**	**Post-Acquisition & LED Upgrade**
Utility-Owned	Included in Lighting Equipment	N/A
City-Owned	$30.00/fixture/year	$18.00/luminaire/year

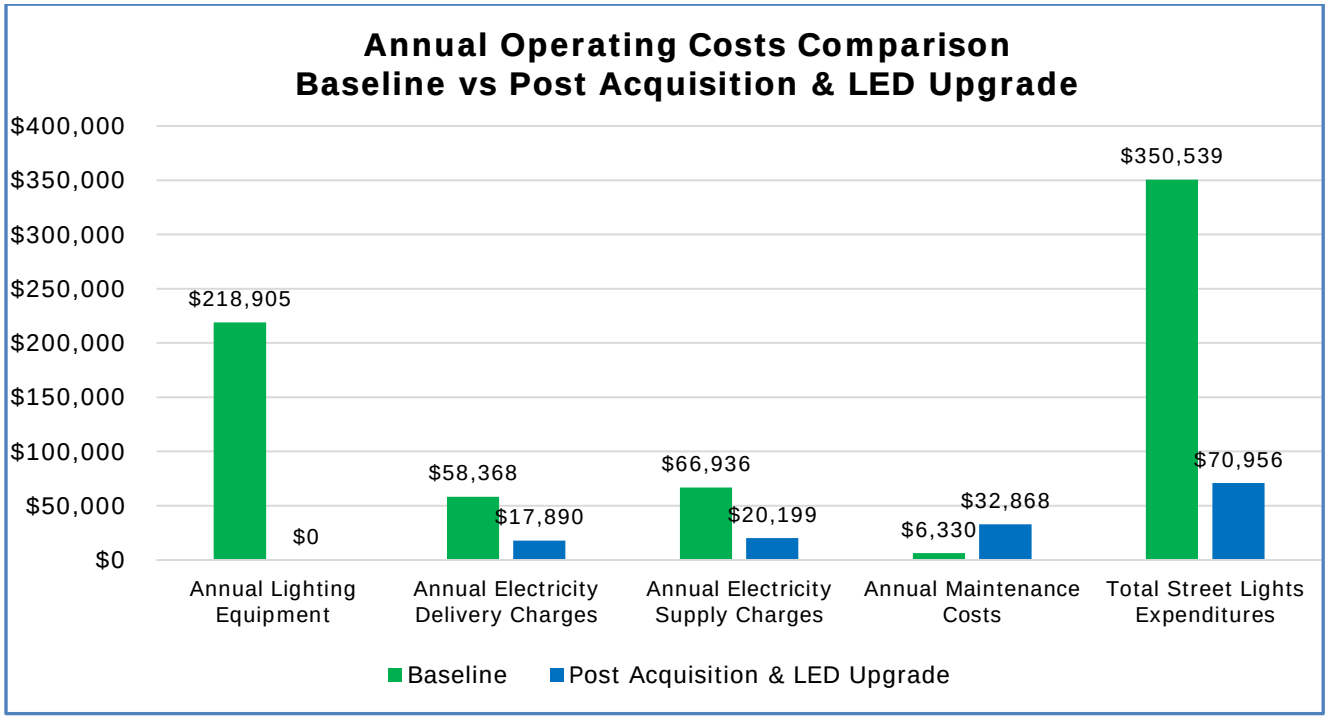
While it is unrealistic to assume that no annual maintenance will be required, the LED luminaires themselves do not contain components that require periodic replacements (such as HPS bulbs and ballasts). We recommend incorporating this estimated figure into municipal budgets to account for eventualities over the life of the fixture that is not covered under the manufacturer's 10-year warranty. The estimated LED maintenance cost includes only the warranty maintenance cost of the fixtures and photocells.

5.4. Other Assumptions

1. Acquisition cost amount of $213,281 from Central Maine Power was provided by the City and is included for analysis purposes only.
2. The estimated incentive is based on the prescriptive rates from Efficiency Maine Commercial & Industrial Prescriptive Incentive Program Lighting Solutions for Interior and Exterior. As of July 1st, 2018, RealTerm Energy was informed that the incentive program now requires lights to be preapproved before purchase and to go through a screening tool to determine the actual incentive base on kWh saved. The prescriptive approach had been used to estimate the incentive which will be confirmed during the application process and subject to Efficiency Maine approval.
3. The final project inventory and associated energy savings are subject to change based on modifications to the scope of work (i.e. removed/added luminaires, field design changes, final utility inventory reconciliation post-installation, etc.) outlined in this IGA report and are to be confirmed in the Final Installation Report (FIR) following the completion of the project close-out. The FIR will then be used to complete the billing change to the Utility/LDCs to reflect the actual installed LED inventory which ultimately will determine the actual energy and cost savings.

5.5. Operating Cost Comparison

PARAMETER (Yr. 1)	BASELINE	POST-ACQUISITION & LED UPGRADE	VARIANCE	PERCENT
Number of Fixtures	**1,832**	**1,826**		
Annual Electricity Consumption (kWh)	**1,136,568**	**353,048**	**783,521**	**69%**
Annual Lighting Equipment	$218,905	$0	$218,905	100%
Annual Electricity Delivery Charges	$58,368	$17,890	$40,479	69%
Annual Electricity Supply Charges	$66,936	$20,199	$46,737	70%
Annual Maintenance Costs	$6,330	$32,868	($26,538)	N/A
Total Street Lights Expenditures	$350,539	$70,956	$279,583	80%
Average Annual Cost per Fixture	**$191**	**$39**	**$152**	**80%**
Savings		**$279,583**		



6. PROJECT COSTS: CAPITAL PURCHASE OPTION

In a Capital Purchase financing option, or a "Design, Upgrade and Transfer", the City arranges the financing of the project.

6.1. Project Costs and Investment Return

PROJECT COSTS	Total
Number of Fixtures	**1,826**
LED Lighting Upgrade Project Cost	*$1,496,453*
Project Contingency (10%)	*$149,645*
Acquisition Cost from Utility	$213,281
Total Project Cost	**$1,859,379**
Estimated Incentive from Efficiency Maine	-$14,000
Net Project Cost	**$1,845,379**

The payback period of the project, before including any financing costs is 5.6 years (excluding project contingency) and 6.1 years (including project contingency).

6.2. Allowances

The total project cost includes provisional allowances as detailed below:

Provisional Items	Cobrahead		Decorative/Flood/Area	
	%	Quantity	%	Quantity
Re-wiring	40%	593	15%	51
Fusing	100%	1,484	100%	342
Fuse Holder Replacement	100%	1,484	100%	342
Cobrahead Bracket Replacement	2%	30	N/A	-
Estimated Police Details (Traffic Control)	$10,000			
Flagging Services (Traffic Control)	100%	1,484	100%	342

Notes:

1. A budgeted lump cost for Police Details has been included. This cost was estimated by the Installer based on the list of streets identified by South Portland as requiring Police services and a map provided by RealTerm Energy.

Billing of Provisional Items

The work covered by the allowances listed above are recommended as they will minimize the likelihood of service calls over the life of the fixtures, thereby greatly reducing maintenance costs. Following the installation phase, should fewer than the estimated provisional amounts be required (re-wiring, fusing, arm replacement, etc.), the costs shall be adjusted in final billing, based on actual work performed. During the installation phase, if additional work is required, the City will be notified first before allowances are exceeded. Any additional work must first be authorized by the municipality and will be handled as a change order.

Luminaires near high voltage wires within a restricted zone:

In the case of Cobrahead fixtures located near high voltage wires within a restricted zone, we have identified 3 different approaches to address and solve the issue while ensuring safety. The exact quantity of the fixtures located within the restricted zone may only be identified in the installation phase.

1. Safety is always the number one priority, and to that end, we will assess each location with the goal of relocating the affected luminaire to a safe location. This may involve the services of an engineer and additional costs imposed by Central Maine Power both of which will become pass-through costs to the City. However, we anticipate a return to the City through lower maintenance costs (fewer service calls) to the luminaire in the future.
2. Engage the services of high voltage crews to replace the existing luminaires. This option comes at a premium price, and is not recommended, as it does not solve any future access issues.
3. RealTerm Energy supplies the fixtures only (uninstalled), and the City can work in conjunction with the local utilities to organize the installation.

If, during the installation, we find luminaires near high tension wires within a restricted zone, we will work with your municipal staff to determine which approach the City prefers.

6.3. Financing Scenario

The following table shows an example of financing based on a representative interest rate.

NET PROJECT COST	TERM (YEARS)	INTEREST RATE	ANNUAL PAYMENT	COST OF BORROWING
$1,845,379	10	3.90%	**$226,387**	$418,494

6.4. Annual Net Savings Over Loan Period

Year	1	2	3	4	5	6	7	8	9	10
Annual Savings	$279,583	$288,235	$297,153	$306,344	$315,816	$325,578	$335,638	$346,006	$356,691	$367,703
Loan Repayment	**$226,387**	**$226,387**	**$226,387**	**$226,387**	**$226,387**	**$226,387**	**$226,387**	**$226,387**	**$226,387**	**$226,387**
Cash Flow	$53,196	$61,848	$70,766	$79,957	$89,429	$99,191	$109,251	$119,619	$130,304	$141,316
Cumulative Cash Flow	$53,196	$115,043	$185,809	$265,766	$355,194	$454,385	$563,636	$683,254	$813,558	$954,874

As can be seen, there are significant net savings from the outset of the project, net of financing costs.

RealTerm Energy has the possibility of assisting the City in obtaining financing through a Tax-Exempt Lease-Purchase Agreement (TELP). Please indicate if your municipality would be interested in this alternative financing option. RealTerm Energy can then place a request to obtain TELP financing proposal rates for 5, 7 and 10-year duration terms, complete with the terms and conditions of the loan.

7. CONCLUSION AND RECOMMENDATION

We have created a designed solution of selected LED luminaires that conforms to the light levels acceptable to the City of South Portland as stated in Section 4.

If the City of South Portland chooses to move forward with the Design, Upgrade and Transfer option, the total project cost will be $1,646,098 (inclusive of a 10% Project Contingency). The City should expect a payback period of 5.6 years (excluding project contingency) and 6.1 years (including project contingency).

The next steps to start the implementation of this new technology and seeing energy and maintenance savings are as follows:

- Meeting to review the IGA with the City's staff and RealTerm Energy
- Approval of the IGA
- Submit rebate/incentive application
- Proceed with the project installation phase
- Procurement of products and labor

8. TERMS AND CONDITIONS

The total project cost includes the following scope of work:

1. Data collection including GIS/GPS mapping of the existing and proposed luminaires
2. Photometric lighting designs
3. Remove existing HID fixtures and supply and install new LED luminaires with photocell controllers as per sections 2.1 in page 5 and 3.1 in page 7
4. All provisions and allowances detailed on Section 6.2 – Allowances
5. Electrical permits and inspection of work
6. Recycling of the removed HID luminaires
7. Project management
8. The City's GIS database will be updated once installation is complete to include final LED inventory installed, date, type, location, etc.
9. Commissioning
10. Completing billing change(s) on your behalf based on the new LED lighting system installed by RealTerm Energy, based on the information provided by the City and the Utility regarding the metered and unmetered lights. RealTerm Energy assumes that the information provided by both parties are accurate and reflects the current state of the actual inventory.
11. Third party quality control for a sample of 2% (or 37 of the installed LED luminaires). Based upon this sample, should further action be required to correct any deficiencies observed in the installation, remedial work and any associated costs shall be borne by the installer
12. Applying on your behalf for the available Efficiency Maine incentives. The final incentive amount will be determined by the Utility and is not guaranteed by RealTerm Energy
13. RealTerm Energy and our Installation Contractor warrant all workmanship completed within the work area for a period of one (1) year following the completion date of the installation
14. The luminaire and photocell are covered by their manufacturer's warranties for 10 and 10 years, respectively
15. This IGA is valid until August 31, 2018
16. The total project cost is in US dollars and does not include any applicable taxes

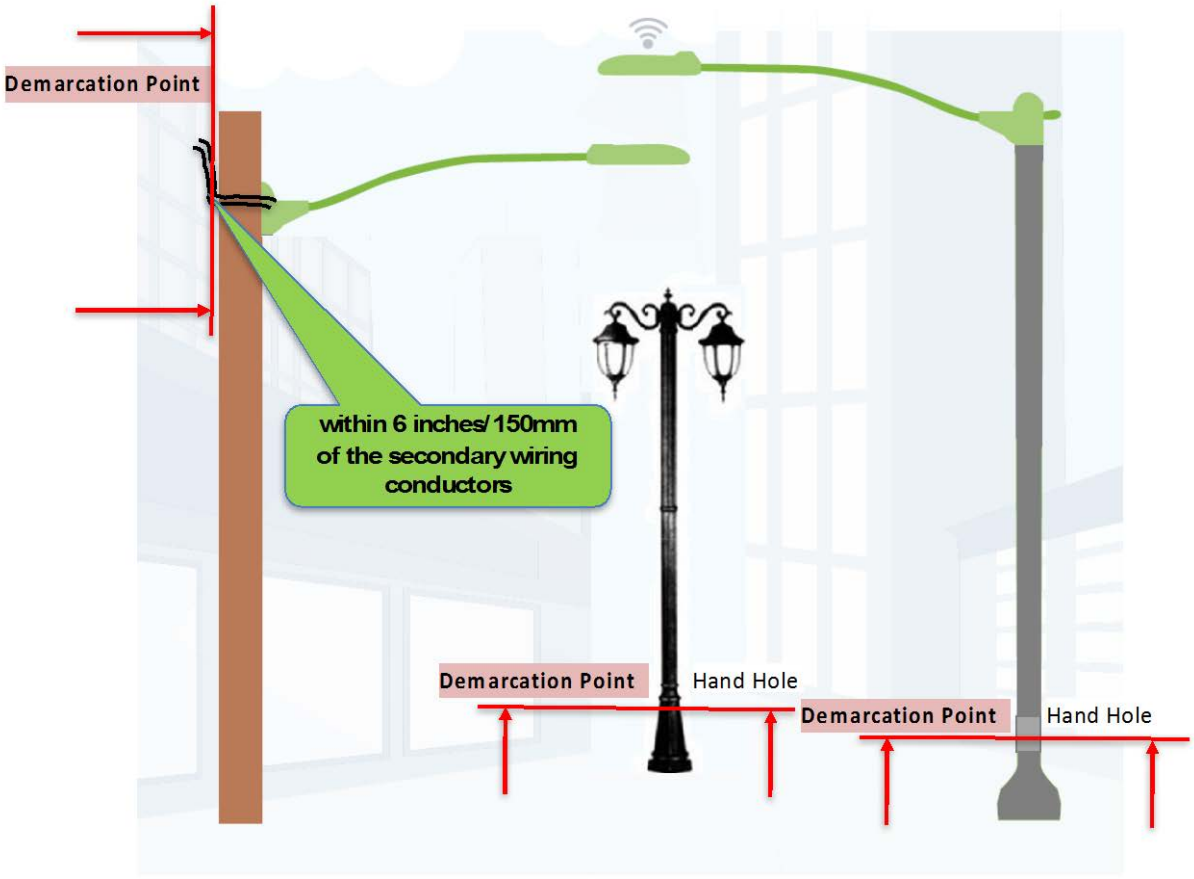
The scope of work set forth herein shall constitute the Project's sole and entire scope of work and supersedes all prior and contemporaneous understandings, agreements, representations and warranties, both written and oral. For greater clarity, this IGA amends and supplements in its entirety the Agreement effective as of **November 15, 2016** by and between the City of South Portland and Realterm Energy US, L.P. (the "Agreement") solely with respect to the scope of work. In the event of any conflict between this IGA and the Agreement, the terms of this IGA shall prevail. The Parties have not relied on any statement, representation, warranty or agreement of the other Party or of any other person acting on such Party's behalf, including any representations, warranties, or agreements arising from statute or otherwise in law, except for the representations, warranties, or agreements expressly

contained in this IGA. Without limitation of the foregoing, the parties acknowledge and agree that the following items are not included in the scope of work, nor the total project cost:

1. Any cost related to upgrading your existing lighting/electrical systems to provincial and/or federal standards.
2. Any cost related to the replacement of the existing relays for the group-controlled streetlights (controller box).
3. Any fees related to the connections to the secondary bus in the unlikely case that the Utility insists on charging a fee.
4. Any other fees which may be charged by a third party.
5. Any costs related to works beyond the Demarcation Point, described as follows:

    - Work performed on the electrical system by RealTerm Energy will be confined to the Luminaire and an area between the agreed upon “Demarcation Point” (in the majority of cases, a point within 6 inches/150mm of the secondary wiring conductors) on what is referred to as the “Tail”. This is the location at which a fuse and fuse holder should exist and acts as a disconnect to allow easy service, protect the new luminaire and wiring from voltage surges and provide a safe working environment. In the event that a fuse and fuse holder do not exist, they will be installed.
    - For decorative poles and stand-alone underground fed units, the “Demarcation Point” is located at the base of the pole in the “Hand Hole”. Where overhead feeds are in use, the “Demarcation Point” is located at the base of the arm holding the fixture, where the connection is made to the secondary wires.
    - If RealTerm Energy dispatches a maintenance contractor and the required repairs are outside of the work areas, we will recommend a solution and communicate this information to the Client for approval before proceeding.

9. SCOPE OF WORK DIAGRAM



The foregoing excluded items and any other items not included within the scope of work may be provided by RealTerm Energy at an additional cost pursuant to a separate written agreement or amendment between the Parties only. The above list of exclusions is not meant to be exhaustive, as network site conditions vary, and shall not operate in any way to limit the exclusions of this paragraph or imply any obligation or duty on the party of RealTerm Energy to complete any work other than the specifically defined scope of work set forth herein.

Greg L'Heureux
Finance Director
25 Cottage Road
South Portland ME 04106

The information contained herein will form part of the installation contract documents as well as the scope of work for the LED streetlighting conversion project. The undersigned is authorized to sign on behalf of the City of South Portland and accepts the entirety this O-0822-P-0663_IGA_South Portland-2018-07-26.

_____

Authorized Signature

_____

Name (please print)

_____

Title (please print)

_____

Date

APPENDIX A: SMART CONTROL APPENDIX

Lighting Control System

Adding adaptive controls can help municipalities make the most of their LED streetlight conversion. By including adaptive controls from the outset, you open yourself up for more energy and maintenance savings, less light pollution, and increased safety on City streets. You also "future-proof" your streetlight network and open up the possibility of adding a myriad of additional Smart City applications later on, without having to spend the time and money going back to streetlights that have already been installed.

The table below presents the estimated additional costs associated with the implementation of a smart control system to the complete inventory in South Portland.

PROJECT COSTS	Total
Number of Fixtures	1,826
Total project cost (Photocells)	$1,646,098
Estimated Smart Control Cost (*)	$179,934
Photocell Credit	-$42,582
Estimated Net Adder for Controls	$137,352
Estimated Net Adder for Controls (with 10% Contingency)	**$151,087**
Estimated Total Project Cost (with Controls)	**$1,797,185**
Acquisition Cost from Utility	$213,281
Estimated Incentive from Efficiency Maine	-$14,000
Estimated Net Project Cost with Smart Controls	**$1,996,466**
Payback Period, Years	**6.5**

(*) Includes Hardware and installation (Smart Nodes and Gateways), Training, and Central Management Software & Licensing for the first year.

Should the City wish to proceed with the implementation of a Smart Control System, RealTerm Energy will run a competitive bid process to select a Controls Provider and obtain firm prices. As depicted in the table above, should the City wish to proceed with Smart Controls, the Net added would be approximately $82.75/fixture, if not lower, following a competitive bid process.

APPENDIX B: LUMINAIRE AND PRODUCT SPEC SHEETS

- The luminaire and product spec sheets are attached as a separate electronic zip file.

APPENDIX C: LUMINAIRE PRODUCT WARRANTY

- The luminaire warranty documents are attached as a separate electronic zip file.

APPENDIX D: PROJECT COST BREAKDOWN

- The Project Cost Breakdown excel spreadsheet is attached as a separate electronic zip file.

APPENDIX E: LIGHTING DESIGN LAYOUTS

- The designs of the proposed LED luminaires are attached as a separate electronic zip file.

APPENDIX F: STREETLIGHT INVENTORY

- The streetlight inventory Excel file and KMZ map are attached as a separate electronic zip file.