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TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON DECEMBER 16, 2014
FROM:	EDWARD SOLDI, P. ENG. DIRECTOR, ROADS & TRANSPORTATION
SUBJECT	TRANSPORTATION ENERGY OPTIMIZATION PLAN (TEOP) UPDATE

RECOMMENDATION

That on the recommendation of the Director, Roads & Transportation, the implementation of Phase 1 of the LED Street Light Conversion Program **BE REFERRED** to the 2015 Capital Budget deliberation.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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For additional information, please refer to the following committee reports:

1. October 19th, 2009: Environment and Transportation Committee “Alternative Street Lighting Technology Review”
2. October 18th, 2010: Environment and Transportation Committee “Alternative Street Lighting Technology Review – Update –”; and
3. April 28th, 2014: Civic Works Committee “Transportation Energy Optimization Plan (TEOP)”

BACKGROUND

In April 2014, the Civic Works Committee was provided with a preliminary plan to convert London’s High Pressure Sodium (HPS) street lights to Light Emitting Diode (LED) street lights. The first step in the plan involved:

- i. Compiling and reviewing the City’s street light infrastructure inventory;
- ii. Preparing LED street light designs for major roads with cobra-style street lights;
- iii. Review of energy costs, maintenance costs and available incentives to calculate a reliable rate of return for a LED conversion project; and
- iv. Review of financing options for the “EC conversion project.

RealTerm Energy (RTE) was retained to complete the above work and this report summarizes their findings.

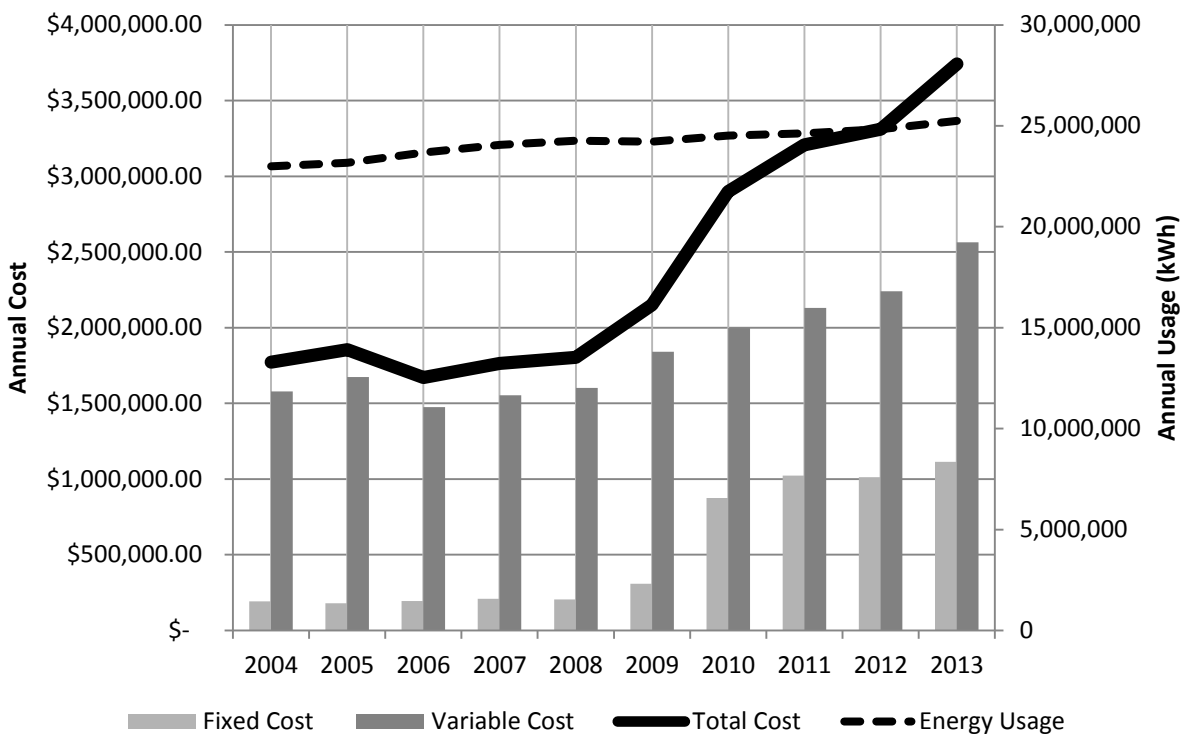
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DISCUSSION

Street Light Energy

The annual street light energy costs have grown significantly over the last 10 years largely due to the cost of the electricity. Only a small portion of the increase can be attributed to growth in the street light network.

Street Light Energy

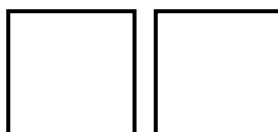


The cost of street light energy can be broken into two types of charges. There are fixed costs or delivery charges for the infrastructure needed to get electricity to the street lights. These charges do not vary based on the amount of electricity consumed. There are also variable charges that are based on the amount of electricity used.

As the above graph shows, the fixed energy costs increased significantly in 2010 and have continued to increase. The variable energy costs have steadily increased. The variable costs represent approximately 70% of the energy bill and can be reduced if energy consumption is reduced. The fixed costs will not reduce if energy usage decreases.

Study Parameters

Phase 1 of the LED Street Light Conversion Program included the cobra-style street light fixtures on major roads. Subsequent phases of the program would address cobra-style fixtures on minor streets (Phase 2) and post-top fixtures (Phase 3). The estimated cost to complete Phase 1 is \$6,000,000 and \$18,500,000 for the remaining two phases. This report concentrates on the implementation of Phase 1 of the LED Conversion Project. Implementation of the remaining two phases will be subject of a future report to this Committee.



Phase 1 Inventory and Design

RTE reviewed the existing street light inventory data and updated data where necessary. The inventory included 9,700 HPS street lights with wattages ranging from 70 W to 400 W. Converting from HPS fixtures to LED fixtures is not as simple as replacing all 70 W HPS fixtures with 25 W LED fixtures. Street light designs are needed to ensure the correct LED fixture is used to achieve the target lighting levels. Where possible the street light designs are to meet the American National Standard Practice for Roadway Lighting (ANSI/IESNA RP-8-00); however, this was not possible for all streets due to constraints such as street light spacing and mounting height which were not to be addressed in the LED conversion project. If the target lighting levels could not be achieved then the design are to meet as close as reasonable to the RP-8-00 standard, noting that the new lighting levels would be higher than the existing.

Using this updated street light inventory data RTE prepared 47 LED street light design templates to replace the existing HPS fixtures with LED fixtures. These templates have been applied to the Phase 1 streets. The following table summarizes the LED conversion for Phase 1:

HPS		LED	
Fixture Wattage (W)	Annual Energy (kWh)	Fixture Wattage (W)	Annual Energy (kWh)
70 - 400	10,076.674	29 – 168	4,408,116

The estimated energy annual energy savings is \$650,000 with an estimated maintenance savings of \$80,000. The estimated annual Green House Gas Reduction is 686 tonnes which is equivalent to 170 cars being removed from service.

Phase 1 Incentives

London Hydro the local utility company offers incentives via a provincially funded program under contract from the Ontario Power Authority (OPA) to help towards the cost of energy saving conversions. The application is currently being reviewed by London Hydro and if it is approved the city would be eligible for \$1,400,000 in incentives for Phase 1 of the LED conversion project. It is possible that incentive levels of the program may be lowered by the OPA.

Phase 1 Cost

RTE has prepared an estimate of the Phase 1 conversion cost and potential incentives as follows:

Total LED Conversion Cost:	\$6,000,000
Incentives:	\$1,400,000
Net LED Conversion Cost:	\$4,600,000
Project Payback Period:	5 to 6 years ⁽¹⁾

Note (1) Without the Incentives the payback period is between 7 and 8 years.

It is anticipated that in March 2015 a joint report from Environmental & Engineering Services and Financial Planning & Policy will be brought forward identifying the Sources of Financing for Phase 1 of the LED Conversion Project.

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SUMMARY

LED street light technology has improved significantly in the last few years with improved technology and more economical pricing. The marketplace has matured to the point that a partial conversion from HPS to LED street lights is appropriate.

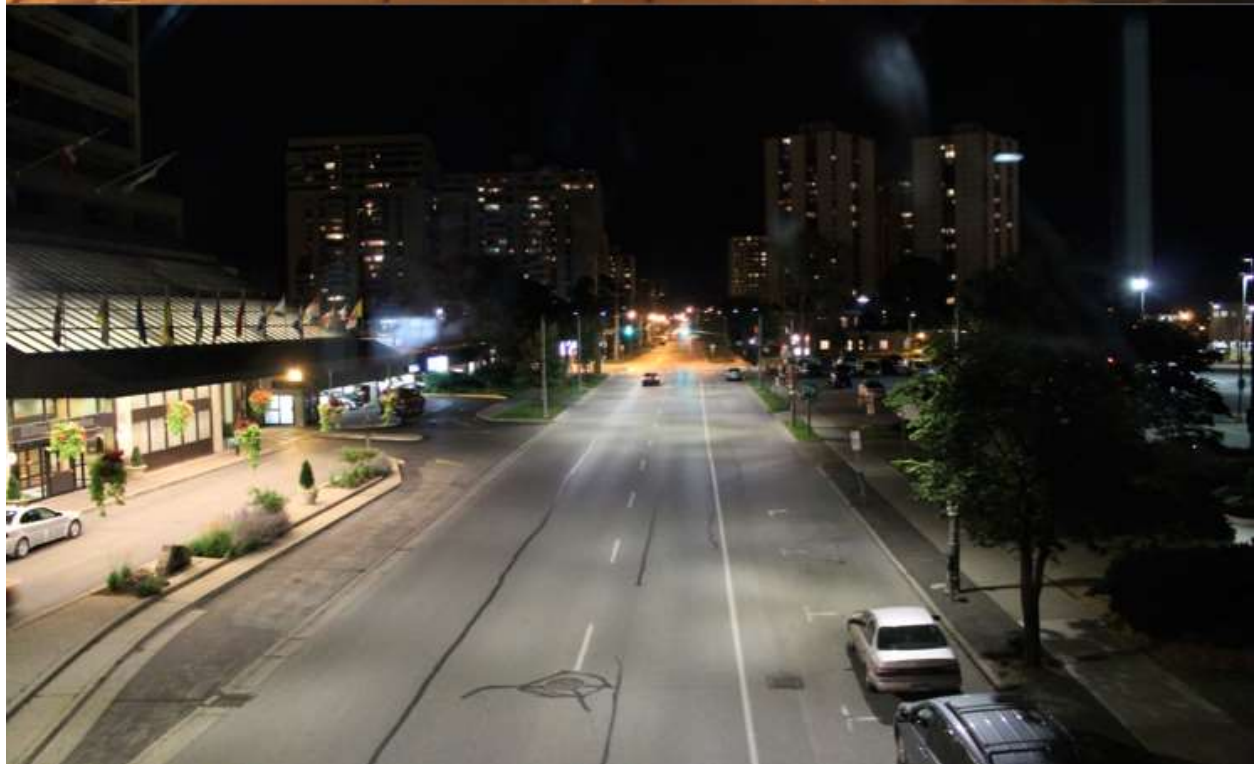


Figure 1: King Street west of Wellington Street (Before and After)

The cost to convert the cobra-style street lights on major roads (9,700 fixtures, ~28% of all fixtures) is \$6,000,000 (Phase 1). With potential incentives the cost to the City reduces to \$4,600,000. The financial payback from energy and maintenance savings is 5 to 6 years. If the conversion program was implemented in 2015 the majority of the savings would start to be seen in 2016.

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PREPARED BY:	RECOMMENDED BY:
SHANE MAGUIRE, P. ENG. DIVISION MANAGER ROADWAY LIGHTING & TRAFFIC CONTROL	EDWARD SOLDO, P.ENG. DIRECTOR, ROADS AND TRANSPORTATION
REVIEWED & CONCURRED BY:	
JOHN BRAAM, P.ENG. MANAGING DIRECTOR ENVIRONMENTAL & ENGINEERING SERVICES AND CITY ENGINEER	

November 27, 2014

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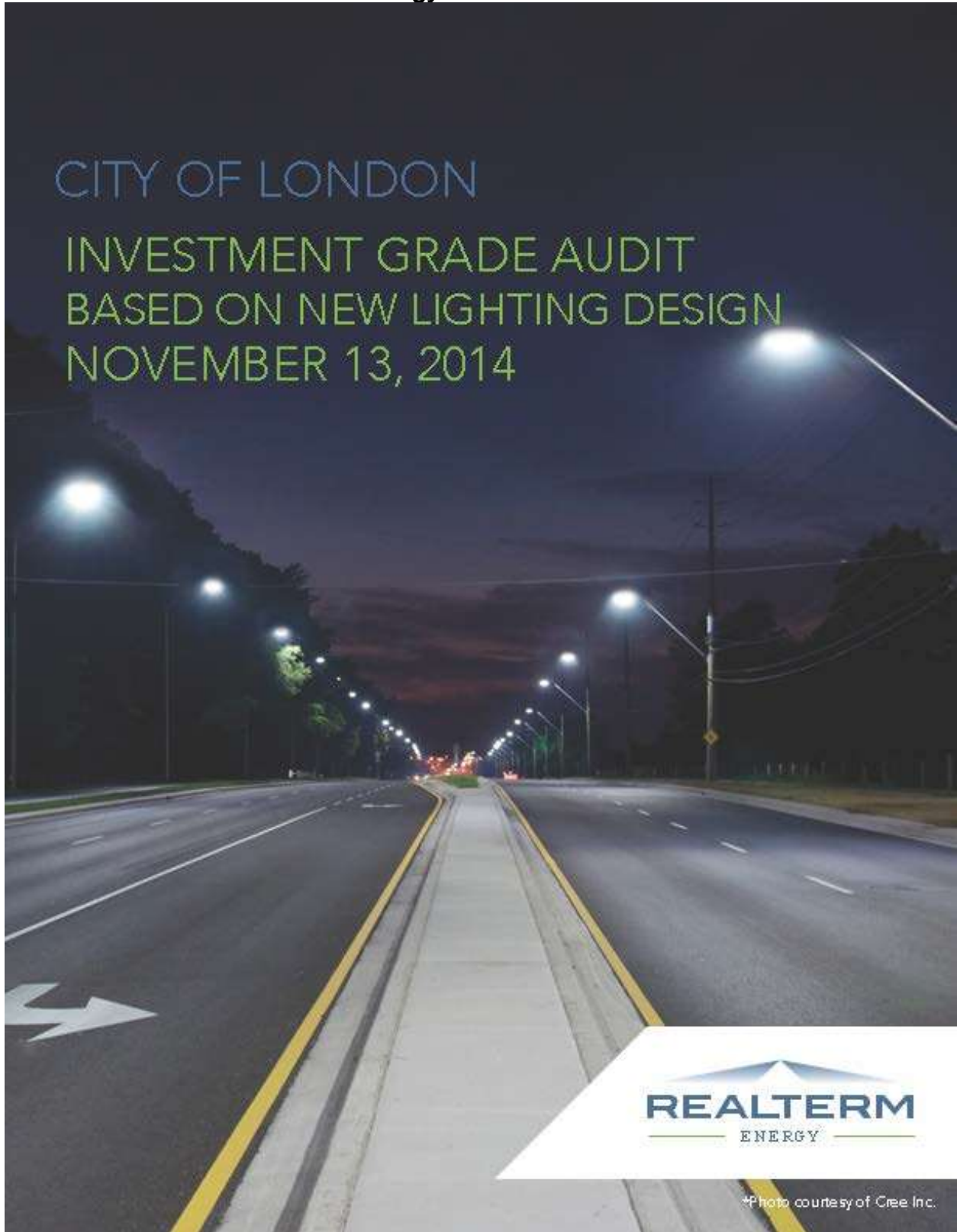
Attach: Appendix "A" – RealTerm Energy Investment Grade Audit
 Appendix "B" – Letter from London Hydro

cc. Finance
 RealTerm Energy
 London Hydro

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Appendix "A"
RealTerm Energy Investment Grade Audit



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CITY OF LONDON INVESTMENT GRADE AUDIT NOVEMBER 2014

November 13, 2014

The City of London
300 Dufferin P.O. Box 5035
London, ON N6A 4L9

Attention: Mr. Shane Maguire

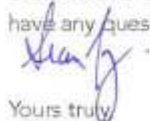
We are pleased to present to you this Investment Grade Audit for phase I of your streetlight network based on new lighting design. This new lighting design was required as we have found that the majority of the collector roads were arterial roads and furthermore the city requested to make a new lighting design for the pedestrian conflicting areas based on medium and high classification. In consequence we had to increase the illuminance levels for the arterial roads and for the pedestrian conflict zones by increasing the power output of the new LED luminaires. The previous IGA report was prepared based on 1,175 LED lights with a unit output above 100W. This new updated IGA report was prepared based on 6,883 LED lights with a unit output above 100W.

After a detailed analysis of 9,668 cobra head street lights in London and conducting their GIS/GPS mapping, we revised the annual energy consumption and savings for the City of London to reflect this portion of your lighting network and the proposed upgrade to LED. Phase I of your street lighting network is currently consuming 10,076,674 kWh. By upgrading to LEDs, your projected annual energy consumption will be 4,408,116 kWh resulting in 5,668,558 kWh energy savings, equivalent to 56% reduction.

The total final project cost for phase I is \$5,898,874. The increase in project cost is due to the fact that the new lighting design is going to use 5.8 times more lights with a unit output above 100W. The final project cost includes 100% rewiring, 100% refusing and a 5% arm replacement.

We would also like to present through this Investment Grade Audit the offer of our Energy Saving's Performance Contract option which would require no upfront cost from the Municipality. Instead, London would yearly redeem 6.5% of the energy and maintenance savings resulting from the LED upgrade for a 10 year contract term.

We look forward to moving the 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



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EXECUTIVE SUMMARY

The table below summarizes our findings based on the lighting Inventory obtained through a GIS/GPS audit of a portion of your street lighting network (9,668 fixtures) and using up to date utility rates of your Hydro Company to calculate current and projected electricity costs. The savings that will be achieved following the LED upgrade will be significant and will benefit the entire municipality.

CURRENT STATUS	BEFORE UPGRADE	POST UPGRADE	VARIANCE	PERCENT
Number of Fixtures	9,668	9,668		
Annual Electricity Consumption (kWh)	10,076,674	4,408,116	5,668,558	56% ↓
Annual Electricity Costs	\$1,585,562	\$931,981	\$653,581	41% ↓
Annual Maintenance Cost (5 yr. avg.)	\$108,129	\$21,626	\$86,503	80% ↓
Total Street Lights Expenditures	\$1,693,691	\$953,607	\$740,083	44% ↓
Average Annual Cost per Fixture	\$175.19	\$98.64	\$76.55	44% ↓



Whether you choose to proceed with the IGA under an Energy Performance Contract option or the Design, Upgrade and Transfer, we revised financial results of both options to account for the portion of the street lights under analysis.

	DUT
Number of Fixtures	9,668
Total Project Costs	\$5,898,874
OPA Rebate	-\$1,398,680
Net Project Costs	\$4,500,194
Price per Fixture Post OPA Rebate	\$465

	EPC
Municipality's Portion	6.5%
RealTerm Energy's Portion	93.5%
Contract Period	10 years
Annual Maintenance	Included

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The OPA incentive is based on the submitted amount for Pre-Approval. This might be subject to change. Consequently the net project cost and the EPC split might change.



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INTRODUCTION

RealTerm Energy Corp. has examined in detail the City of London’s existing streetlight network records to produce this Investment Grade Audit. Our analysis included the following stages:

- Evaluate existing GPS/GIS data of the entire street light inventory of the municipality
- Reconcile differences between the municipality’s and the Utility’s records if required
- Work with Cree Lighting to apply appropriate LED based lighting designs
- Update the replacement LED fixtures from the desktop review
- Examine in detail the municipality’s utility bills
- Confer with utility to address any questions or ambiguities found
- Examine detailed maintenance records of the municipality
- Establish baseline results for energy usage and maintenance costs
- Project revised estimated costs and cost savings

A summary of our findings is shown below:

	IGA RESULT
Number of Fixtures (Phase I)	9,668
Type of Fixture	HPS
Energy Savings (%)	56.3%
Energy Consumption (kWh)	10,076,674
Projected Annual Electricity Costs	\$1,585,562
Annual Maintenance Cost (5 year average)	\$108,129
Total Street Lights Expenditures	\$1,693,691
Average Annual Operating Cost per Fixture	\$175.19

For the first phase of the project, only 9,668 Street Lights out of the total street lighting network of London will be replaced. Results throughout this report reflect this first portion only.

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GPS MAPPING

RealTerm Energy engaged an outside consulting firm to conduct a complete inventory of the City of London’s phase I street lights. Information from this review was compiled and studied to obtain a detailed picture of the City’s current phase I network including the following:

- Accurate count of all fixtures and fixture types
- Wattage of each current fixtures
- Length of fixture arms, fixture height, setback from roadway, pole spacing, etc.
- GPS coordinates
- Road classifications
- Hydro pole ID numbers (when available)

From this database, we were able to assess the exact state of the City’s phase I streetlight inventory to enable us to clearly define the current street light demand, which is employed to accurately estimate the energy savings obtained from the conversion of London’s current phase I street lights to LEDs.

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

GPS INVENTORY (Actual)

TYPE	WATTAGE	BALLAST	QTY	TOTAL WATTS	DEMAND (kW)
HPS 70W	70	95	239	22,705	22.71
HPS 100W	100	124	562	69,688	69.69
HPS 150W	150	180	2235	402,300	402.30
HPS 200W	200	246	2687	661,002	661.00
HPS 250W	250	300	3895	1,168,500	1168.50
HPS 400W	400	475	50	23,750	23.75
TOTAL			9,668	2,347,945	2347.95

Initially, during the GIS/GPS survey, approximately a 15% discrepancy was found between the collected data and the actual inventory of London which was then adjusted and revised to reflect London’s actual Lighting inventory that is currently under analysis.

There is also 126 LED fixtures that were not accounted for in the total fixture Count for phase I since they will not be replaced.

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LED REPLACEMENT INVENTORY

The reduced demand after the implementation of the LED street lights upgrade will directly impact the annual energy consumption, measured in kWh. Our findings show that the demand will be reduced by 1,321 kW. Consequently, the energy savings achieved will result in 56% –Savings equivalent to 5,668,558 kWh annually.

The table below illustrate the proposed changes to the City’s inventory, based upon our examination of the GPS data and lighting design results. A summary table detailing the savings in demand from the LED update is also found below:

LED REPLACEMENTS (Actual, Post-Upgrade)

TYPE	WATTAGE	BALLAST	QTY	TOTAL WATTS	DEMAND (kW)
CREE - XSP-1 - 29W	29	29	2	58	0.06
CREE - XSPR - 42W	42	42	100	4,200	4.20
CREE - XSP-1 - 43W	43	43	155	6,665	6.67
CREE - XSP-1 - 53W	53	53	39	2,067	2.07
CREE - XSP-2 - 56W	56	56	77	4,312	4.31
CREE - XSP-2 - 65W	65	65	371	24,115	24.12
CREE - XSP-2 - 73W	73	73	456	33,288	33.29
CREE - XSP-2 - 76W	76	76	490	37,240	37.24
CREE - XSP-2 - 83W	83	83	972	80,676	80.68
CREE - XSP-2 - 91W	91	91	110	10,010	10.01
CREE - XSP-2 - 94W	94	94	9	846	0.85
CREE - XSP-2 - 97W	97	97	4	388	0.39
CREE - XSP-2 - 101W	101	101	2372	239,572	239.57
CREE - XSP-2L - 112W	112	112	2413	270,256	270.26
CREE - XSP-2L - 134W	134	134	858	114,972	114.97
CREE - XSP-2L - 136W	136	136	47	6,392	6.39
CREE - XSP-2L - 153W	153	153	557	85,221	85.22
CREE - XSP-2L - 168W	168	168	636	106,848	106.85
TOTAL			9,668	1,027,126	1027.13

SUMMARY

Investment Grade Audit	
Demand Before the Upgrade kW	2,348
Demand After the Upgrade kW	1,027
Difference	-1,321
	-56%

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LED LIGHTING DESIGN

RealTerm Energy's technical evaluation team reviewed the GPS information we received, and formulated a hybrid approach to completing roadway designs for The City of London. After evaluating the configuration of each light fixture for road classification, pole spacing, mounting height, arm length and curb setback, we were able to conclude that London can achieve the same or better light levels than those of its current incumbent street lights. The lighting design as suggested for the most part meets RP-8 lighting levels. (RP-8 is a recommended, though not required practice for roadway illumination)

Those portions of the City's lights points that do not meet RP-8 could be for a number of reasons, including:

- Inadequate Pole Spacing (too far apart),
- Insufficient Mounting Height, or
- Missing Light Fixture

We concluded that in order to fully comply with RP-8 guidelines, the high costs of the required pole additions, replacements, rewiring and retrenching would render the project uneconomical.

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

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

ENERGY CONSUMPTION		%
Current Annual Energy Consumption (kWh)	10,076,674	
Projected LED Annual Energy Consumption (kWh)	4,408,116	44%
Annual Savings (kWh)	5,668,558	56%

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FINANCIAL OPTIONS

For the Investment Grade Audit, the financial results of the Energy Performance Contract and the Design, Upgrade and Transfer option are presented to provide the City with both option in order to decide of the contract that best meets with the needs of London. For our Design, Upgrade & Transfer option, the Municipality would finance the project on its own while for the Energy Performance Contract RealTerm Energy would fund 100% of the costs, operate the system for 10 years and share the energy and maintenance savings with the municipality on a pre-determined basis.

DESIGN, UPGRADE & TRANSFER

PROJECT COSTS, SAVINGS AND INVESTMENT RETURN

PROJECT COSTS		PROJECT SAVINGS		VALUE	VARIANCE
Number of Fixtures	9,668	LED Energy Consumption	4,408,116 kWh	56%	↓
Total Project Costs	\$5,898,874	Year 1 LED Energy Costs	\$931,981	41%	↓
OPA Rebate	-\$1,398,680*	Year 1 Maintenance Costs	\$21,626	80%	↓
Net Project Costs	\$4,500,194	Year 1 Operating Costs	\$953,607	\$740,083	↓
Price per Fixture	\$465	Year 1 Cost per Fixture	\$99	\$77	↓

**Based on previous Submission for OPA Pre-Approval*

We quoted based upon 100% of the fixtures being completely rewired and re-fused, as well as an amount to replace 5% of the arms. In so doing, we have minimized the likelihood of a service call over the life of the fixtures, which will greatly reduce maintenance costs over the long term.

INVESTMENT RETURN

The simple payback period of the project, before including any financing costs is **5.68 years**.

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Note: The OPA Rebate of \$1,398,680 was sent for Pre-Approval following the previous IGA report of September. It is calculated based on the adjusted output of the luminaire. The Incentive will be subject to change if new rules apply.

You will be notified once we receive the Pre-approval from the OPA Program and if any changes will occur in the incentive amount.

INFRASTRUCTURE ONTARIO LOAN

Infrastructure Ontario offers loans at favorable rates to most municipalities seeking to improve their civic infrastructure. Interest rates vary with market conditions and are set at the prevailing rate at the time the loan is advanced. The table below summarizes payment options which would be available to fund the project through Infrastructure Ontario.

CAPITAL COST	TERM (YEARS)	INTEREST RATE	ANNUAL PAYMENT	COST OF BORROWING
\$4,500,194	10	1.99%	\$496,454	\$464,346
\$4,500,194	15	2.72%	\$365,309	\$979,439
\$4,500,194	20	3.13%	\$302,472	\$1,549,247

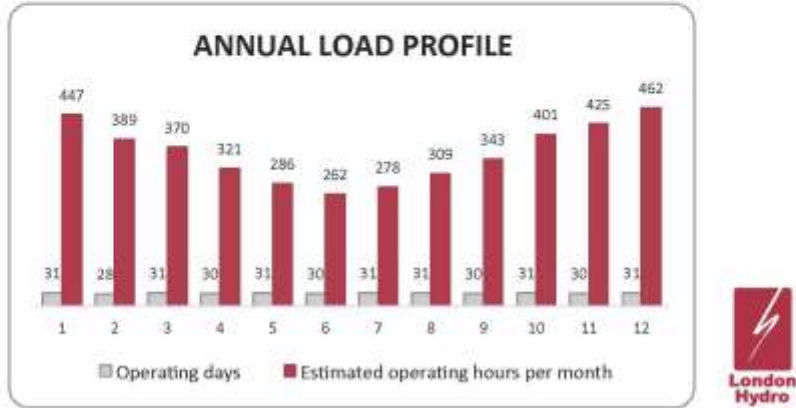
NET SAVINGS AFTER FINANCING COSTS:

Year	1	2	3	4	5	6	7	8	9	10	11-15
Annual Savings	\$740,083	\$761,421	\$783,381	\$805,983	\$829,244	\$853,185	\$877,826	\$903,186	\$929,288	\$956,153	\$5,212,068
Loan Repayment	\$496,454	\$496,454	\$496,454	\$496,454	\$496,454	\$496,454	\$496,454	\$496,454	\$496,454	\$496,454	\$0
Net Savings	\$243,629	\$264,967	\$286,927	\$309,529	\$332,790	\$356,731	\$381,372	\$406,732	\$432,834	\$459,699	\$5,212,068

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LONDON HYDRO'S LOAD PROFILE

The annual load profile is a critical part of the Baseline calculation, used to project the actual energy consumption and savings that will be realized after the upgrade. Our projections and guaranteed energy savings figures take this load profile into account.



BASELINE ENERGY CALCULATIONS

Utilities charge for two types of fees: fixed and variable. The fixed fees will remain the same before and after the upgrade because the rate is charged per connection, while the variable components of the bill vary depending on the consumption, also known as 'demand'. Higher fixed fees as a percentage of the total mean less dollar savings due to a change in demand.

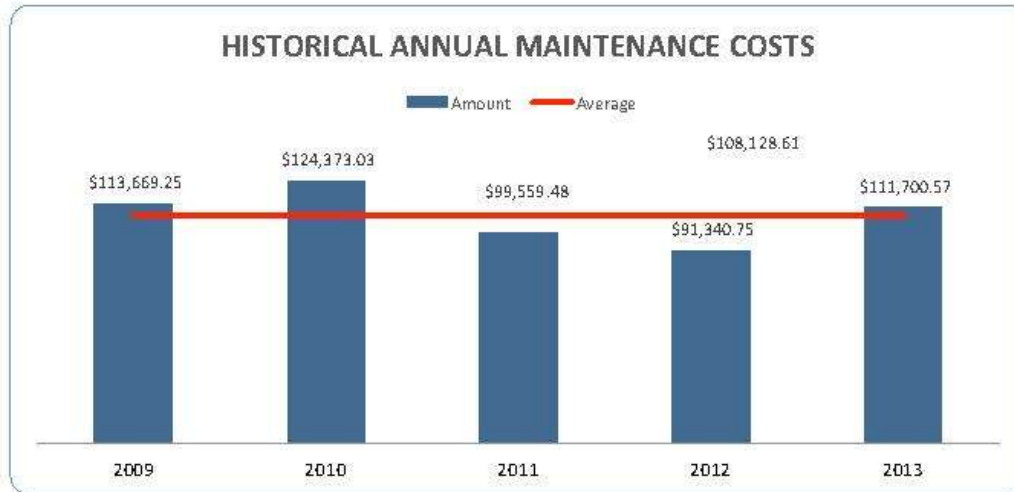
In the case of London, the fixed fees currently represent 27% of London's street light energy bill. We have evaluated the post retrofit energy costs based on the assumption that there will be no savings on the distribution volumetric rate. We adopted this very conservative approach to show less energy cost savings in order to protect the interest of the Municipality.

	Fixed Fees	Variable Fees	Total Cost (Inc. HST applicable)
Before	\$416,404.84	\$1,141,750.77	\$1,585,562.01
After	\$416,404.84	\$499,467.37	\$931,961.48
Savings			\$653,580.53



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BASELINE MAINTENANCE



We have examined the maintenance costs for the past 5 years (as provided by the municipality). The average is \$99,560 per annum, which equates to roughly a cost per fixture of \$11. Streetlight maintenance required during the 10 year Energy Performance Contract will be undertaken by RealTerm Energy, which will reduce the actual expenses incurred by the municipality to zero for streetlight maintenance. This amount is used to calculate the proportionate share to be split by the municipality and RealTerm Energy over the contract life.

Energy & Maintenance Total Savings

	Before	After	Savings
Energy	\$1,585,562	\$931,981	\$653,581
Maintenance	\$108,129	\$21,626	\$86,503
Total	\$1,693,691	\$953,607	\$740,083

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ENERGY PERFORMANCE CONTRACT

With an accurate inventory, as well as a breakdown of the energy bills and utility rate structure, we have established the Baseline, which gives an accurate statement of what the municipality would be spending on the existing streetlight network prior to commencing the upgrade (subject to rate changes by the utility). The establishment of the Baseline is critical in computing the future energy and cost savings that will accrue from upgrading the system to LED and determining the split of the shared savings between the Municipality and RTE.

IGA Results	
Up-front Capital Requirement	Nil
Municipality's Savings Portion	6.5%
RTE's Savings Portion	93.5%
Annual Savings to Client*	\$49,289
Estimated Value of Energy Savings (Over 10 years)	\$484,835
Contract Period	10 years
Annual Maintenance	Included

**Year One Combined Electricity and Maintenance Savings*

**** Important notice:** The split of the cost savings between the City and RTE was calculated based on a OPA rebate of \$1,398,680 which will be paid to RTE. In the event that the amount of OPA rebate approved and paid by the LDC will increase or decrease or will be canceled, RTE will be entitled to recalculate (increase or decrease) the split of the cost savings in order to conserve the commercial and economic balance of the contract.

What is Included in the Energy Performance Contract Option

The same deliverables included in the Design, Upgrade and Transfer Option PLUS

- Guaranteed Energy Savings throughout the Term
- RealTerm ensures that the network operates to established parameters
- RealTerm is responsible for all luminaire maintenance over the Term
- At end of Term, operations revert back to Municipality who then enjoys 100% of the savings
- Asset ownership rests with Municipality throughout

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GREENHOUSE GAS REDUCTION

ESTIMATED GREEN HOUSE GAS REDUCTION		IGA Results
Current Annual Energy Consumption (kWh)		10,076,674
Projected LED Annual Energy Consumption (kWh)		4,408,116
Annual kWh Savings		5,668,558
Estimated Annual GHG Reduction (metric tonnes)		567
GHG Reduction over Luminaire Life (metric tonnes)		13,038



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CONCLUSION AND RECOMMENDATION

- We have implemented a designed solution of selected LED luminaires that conform to RP-8 guidelines for the majority of the applications.
- This combination of LED luminaires will result in energy consumption savings of 5,668,558 kWh per year over the incumbent HPS fixtures which is equivalent to **56% energy savings**.
- If the City of London chooses to move forward with the Design, Upgrade and Transfer option, the total project cost will be \$5,898,874 which includes 5% arm replacement and re-wiring and re-fusing of all fixtures. The City should expect a payback period of 5.68 years with an OPA rebate of \$1,398,680 calculated based on the adjustable output of the lights in the past report of September.
- If the City of London chooses to move forward with the Energy Performance Contract, we propose that the portion of the combined energy and maintenance savings accruing to the municipality be **6.5%** with RealTerm Energy receiving the remainder of the savings over the 10 year term of the Energy Services Agreement. The share of London results in \$49,290 for the first year.

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

1. Meeting to review IGA with staff and RealTerm energy team
2. Approve IGA
3. Submit OPA rebate (prepared by LAS rep, but municipal staff must submit)
4. Review contract to proceed with project
5. Sign contract

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CITY OF LONDON · INVESTMENT GRADE AUDIT · NOVEMBER 2014

APPENDIX A

- PROPOSED MAINTENANCE SCHEDULE



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PROPOSED MAINTENANCE SCHEDULE

OUR OEM PARTNER, CREE LIGHTING GUARANTEES ALL OF ITS LUMINAIRES FOR A PERIOD OF 10 YEARS FROM THE DATE OF INSTALLATION.

A detailed Maintenance schedule for the Energy Performance Contract proposed in Option 2, will be included as an integral part of the EPC. However, prior to the finalization of network design parameters, RealTerm Energy's proactive maintenance obligations are generally inclusive of the following items:

- Annual reporting
- Periodic technical diagnostics to determine network effectiveness
- Defective photocell replacement
- System troubleshooting
- Prompt system repairs
- Cleaning as required

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Appendix "B"
Letter from London Hydro



November 27, 2014

111 Horton St.
P.O. Box 2700
London, Ont.
N6A 4H6

City of London
Roadway Lighting
300 Dufferin Ave
London, Ontario

Attention: Mr. Shane Maguire, Division Manager, Roadway Lighting & Traffic Control

RE: Street light LED retrofit project

This letter is further our conservations on the proposed LED street lighting upgrade project. I would like to acknowledge that London Hydro is in receipt of a prescriptive incentive application for the saveONenergy retrofit program in regards to phase 1 of your intended project.

You have requested a letter of support for your project

Currently the saveONenergy Retrofit program worksheets are under review. London Hydro at this time is unable to approve any LED retrofits using the prescriptive worksheets. The worksheets are currently under review by the OPA and LDC working groups. All customers and applicant representatives continue to be permitted to submit applications under the Engineering Worksheet method, which permits incentives at \$ 0.05 / kWh.

London Hydro under the saveONenergy programs supports energy reduction projects that can be properly measured and verified. Once the new LED worksheets and policies have been vetted by the OPA and agreed to by London Hydro, we will be able to assist in obtaining the appropriate incentive at that time. A thorough review of the audit, and calculations will be required prior to making the final incentive determination.

Further clarification of program rules will be necessary if the City chooses to consider the Energy Services Contract option for an application of that scope.

Yours Truly

London Hydro Inc.

Hans Schreff
Manager of CDM Programs

Our Commitment is To Our Customers