

## Request for Recommendation

## Finance and Administration Committee




Type of Decision									
Meeting Date	February 11, 2015				Report Date	February 11, 2015			
Decision Requested	x	Yes		No	Priority	x	High		Low
	Direction Only				Type of Meeting	x	Open		Closed

Report Title
LED Streetlight Conversions, Supplementary Report

Budget Impact/Policy Implication		Recommendation	
x	This report has been reviewed by the Finance Division and the funding source has been identified.	<p>That authority be provided to the General Manager of Infrastructure Services to complete retrofits of all CGS streetlights, subject to a positive business case, as outlined in the report from the General Manager of Infrastructure Services dated January 28, 2015 and that;</p> <p>It is a multi-year program with locations determined by the General Manager of Infrastructure Services and that;</p> <p>Preliminary estimates to finance this project in the amounts of \$4 million in 2015, \$2 million in 2016, and \$2 million in 2017 be provided from the Capital Financing Reserve Fund – Roads and that;</p> <p>Savings from the project be credited back to the Capital Financing Reserve Fund – Roads until the capital investment has been reached and that;</p> <p>The General Manager of Infrastructure Services be provided the authority to maximize the available per fixture grant in 2015 and that;</p>	
<p>If approved, funding for this project is provided for in the 2015 Capital Budget and 2016-2017 outlook. Annual funding allotments will be drawn from the Capital Financing Reserve Fund – Roads. The balance in this reserve fund as of December 31, 2014 is \$10 million. Approval of this initiative commits \$8 million from this reserve fund. Savings generated will be used to pay back the reserve fund until the entire amount is repaid.</p>			
x	<b>Background Attached</b>	x	<b>Recommendation Continued</b>

Recommended by the Department
 Tony Cecutti General Manager of Infrastructure Services

Recommended by the C.A.O.
 Doug Nadrozny Chief Administrative Officer

Report Prepared By	Division Review
 Tony Cecutti General Manager of Infrastructure Services	

## RECOMMENDATION CONTINUED

Procurement of the contract is to include design, supply and installation of LED fixtures in accordance with the City's Roadway Lighting Policy and Pedestrian Lighting Standards and that;

Staff report back to Operations Committee annually on the progress of the LED Streetlight Conversion Program.

## BACKGROUND

Please refer to attached supplemental information.



## MEMO

TO: Mayor and Council

FROM: Tony Cecutti, General Manager, Infrastructure Services

CC: Doug Nadorozny, CAO

RE: LED Street Light Retrofit Rebate Opportunity, 2015  
Supplement to Staff Report to Operations Committee,  
February 3, 2015

DATE: February 10, 2015

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Please find attached supplemental information to our February 3, 2015 staff report regarding an opportunity to obtain a rebate from the Ontario Power Authority. The report provides information that is supplementary to our original report, and should be read in conjunction with that information.

Two key requests came out of the discussion at Operations Committee, summarized as follows. Staff was asked to provide any additional information that formed the basis of the numbers in our staff report and substantiated the business case study to date. Secondly staff was asked to provide a summary of the information available to date on the 2012 LED street light retrofit program.

## **LED Streetlight Project** **Supplementary Information**

### **Background**

This supplementary information is provided in response to the Operations Committee request on February 3<sup>rd</sup>, 2014 for additional financial data regarding Light Emitting Diode (LED) streetlights.

In November 2014, the City was advised that it could receive a per fixture rebate for converting current High Pressure Sodium (HPS) streetlights to LED. The amount of the rebate varies depending on the wattage of the bulb being replaced. In aggregate, this rebate is approximately \$1.85M if all streetlights were retrofitted to LED. City staff met internally as well as with Greater Sudbury Utilities (G.S.U.) staff and LED providers in an attempt to complete a preliminary business case that would provide sufficient information to suggest that a conversion of this magnitude is feasible and to satisfy staff that it had the potential to be a worthwhile endeavor.

Table 1 below was calculated by City staff in conjunction with G.S.U. staff and indicates the projected energy savings (kWh) if the City were to retrofit all existing streetlights to LED. The total streetlights and energy savings are divided between the two energy distributors based on the number of lights in their respective jurisdiction. As can be seen, the estimated electricity savings are approximately 37%. This analysis is based on replacement of current wattages with equivalent LED wattages. It has been suggested by product providers that some wattages may be able to be reduced upon conversion, thereby increasing the rate of energy savings. However, this would need to be determined through a design of the streetlight network to ensure adequate lighting is provided.

**Table 1**  
**Electricity Consumption**

	<b>GSU</b>	<b>HONI</b>	<b>Total</b>
Number of Fixtures	6,232	5,056	11,288
Electricity Before Retrofit (kWh)	6,978,431	4,944,943	11,923,374
Estimated Electricity Savings (kWh)	2,496,966	1,942,972	4,439,938
<b>Estimated Energy Reduction</b>	<b>35.80%</b>	<b>39.30%</b>	<b>37.20%</b>

This savings in energy was then translated into a potential cost reduction based on the rates of the City's two energy distributors –G.S.U. and Hydro One Networks Incorporated (HONI). Table 2 below illustrates the expected energy savings based on the above analysis and returns a payback period based on an estimated capital cost.

**Table 2**  
**Pay-Back (Years) for Conversion (Estimated)**

<b>Estimated Capital Costs</b>	<b>GSU</b>	<b>HONI</b>	<b>Total</b>
Material Costs	3,000,000	2,000,000	5,000,000
Installation	1,500,000	1,000,000	2,500,000
Design	120,000	80,000	200,000
Management/Contingency	180,000	120,000	300,000
<b>Total Estimated Capital Cost</b>	<b>\$4,800,000</b>	<b>\$3,200,000</b>	<b>\$8,000,000</b>
Less: Rebate	\$1,109,809	\$744,661	\$1,854,470
<b>Net Capital Cost</b>	<b>\$3,690,191</b>	<b>\$2,455,339</b>	<b>\$6,145,530</b>
Estimated Reduction in Hydro Costs	\$285,512	\$378,232	\$663,744 *
<b>Pay-Back (Years) after Rebate</b>	<b>13</b>	<b>6</b>	<b>9 **</b>

**Notes:**

\*Based on replacement of equivalent wattage LED at current hydro rates.

\*\* Does not include maintenance savings as City currently has a fixed price contract with G.S.U. ending March, 2015. Lost interest revenue is also not included.

Further, preliminary work on this project also reviewed the sensitivity of the project to various capital cost structures. Table 3 below displays the results of this analysis.

**Table 3**  
**Sensitivity Analysis**  
**Pay-Back (Years) after Rebate**

<b>Realized Capital Cost Scenarios</b>	<b>GSU</b>	<b>HONI</b>	<b>Total</b>
\$6M	9	4	6
<b>\$8M</b>	<b>13</b>	<b>6</b>	<b>9</b>
\$10M	17	9	12
\$12M	21	11	15

As is evident in Table 3, the payback period differs among the various energy distributors. This is largely a result of the billing structure at each utility. G.S.U. maintains a higher percentage of their bill devoted

to a fixed charge, whereby HONI charges are proportionately more variable. As a result, savings on energy consumption are more fully translated into financial savings at HONI and in turn reduce the payback period of expended capital.

There are still some issues that remain to be factored in to the above analysis. These include maintenance savings, wattage replacement, confirmed capital cost, number of lights to be replaced and design that would indicate if there are any additional lights needed. This will be dealt with as follows:

Maintenance costs: As the life expectancy of an LED is approximately 4 times longer than an HPS light, it is reasonable to expect some savings in the maintenance of streetlights. Currently, G.S.U. is under a fixed contract to provide maintenance to the entire streetlight network. This contract expires at the end of March, 2015. Staff will be reviewing the requirements to ensure that the City benefits from reduced maintenance to current and future LED conversions.

Wattage replacement, confirmed capital cost and number of lights: These will all be confirmed upon receipt and award of a competitively procured contract.

The business case for this project will be continually updated as the above information is received and evaluated to ensure that the City is receiving an adequate payback on its capital investment.

## 2012 Experience

At the Operations Committee on February 3<sup>rd</sup>, 2014 a request for additional information regarding the 2012 LED conversion program was made. Table 4 below summarizes the results of this capital investment. As can be seen, the capital cost was significantly lower than the estimated cost by approximately \$200,000 resulting in a reduced cost per fixture after the \$245 rebate.

**Table 4**  
**2012 Streetlight Conversions-Capital Cost**

	<b>Per Report</b>	<b>Actual</b>
# Fixtures	1,315	1,319
Capital Cost	1,250,254	1,050,006
Incentives (\$245/fixture)	(322,175)	(323,155)
<b>Net Capital Cost</b>	<b>928,079</b>	<b>726,851</b>
Cost per Fixture	706	547

Table 5 below depicts the operating results of the 2012 LED conversions. This capital investment has not yielded the expected operating savings in maintenance or energy costs. The expected maintenance savings were not realized as maintenance was already under a fixed contract with G.S.U. and the contract was not successfully renegotiated. Energy costs were not reduced by the expected amount as a result of a change in billing structure at G.S.U. In May, 2013 a revised billing structure which included a large increase in fixed costs reduced potential energy savings by approximately \$16,000 in 2013. This structure has been carried forward and reduced anticipated savings by approximately \$25,000 in 2014.

These reduced savings result in a payback period of 25 years, assuming \$38,572 savings in year one and \$28,816 annually after that. Upon successful renegotiation/procurement of a new maintenance contract, the payback period will be revisited and adjusted to reflect savings as a result of these conversions.

**Table 5**  
**2012 Streetlight Conversions**

	Per Report	Actual Savings	
		2013	2014
Maintenance Savings	36,729	0	0
Energy Savings	55,000	38,752	28,816
Total Savings	91,729	38,752	28,816
 <b>Payback Period</b>	 <b>10.1</b>	 <b>25</b>	

### Summary

In summary, the opportunity to benefit from LED conversions may exist well into the future. However, the City is faced with the opportunity to benefit from an additional rebate program that has the potential to offer an approximate 20-25% discount on the capital cost of replacement. Typically the City will have a more defined case for a project of this magnitude, however there are still a number of issues that need to be dealt with and it was determined that to deal with them sequentially would reduce the ability of the City to maximize the per fixture rebate. These issues already identified include maintenance costs, design of streetlights, number and wattage of replacements achievable in 2015 and dialogue with the City's energy distribution partners in regards to rate structures. This more parallel program of implementation alongside design and analysis is being recommended in order to receive maximum benefit of the rebate program.