Business Case for Service Level Change

Request/Project Name:	LED Streetlight Conversion		
Department:	Corporate Services	**Division:**	Finance, Assets and Fleet
		Council Resolution (if applicable):	

I. Executive Summary

Overview of Proposal

The City of Greater Sudbury (CGS) owns all streetlights within the City with electricity provided through either Greater Sudbury Utilities (GSU) or Hydro One Networks Inc. (HONI), depending on the area serviced. GSU also provides technical support, advice, and is contracted to maintain the system including the streetlight inventory database, and the repairs and maintenance of the streetlights. There are approximately 15,023 streetlights in the City's inventory, with 61% serviced by GSU and 39% serviced by HONI. Of the current inventory, approximately 3,991 are Light-Emitting Diode (LED). LEDs are more energy efficient and have a longer useful life than traditional streetlights. The following business case proposes converting the remaining high pressure sodium (HPS) and low pressure sodium (LPS) streetlights to LED. If the conversion is completed by December 31, 2020, the City is eligible for a $0.56 million rebate for construction costs through the Independent Electricity System Operator (IESO) retrofit program. It is also anticipated that the City would realize significant energy cost savings.

II. Background

Current Service Level

There are approximately 11,032 HPS/LPS and 3,991 LED Streetlights in the City of Greater Sudbury. The 2020 budget for energy costs is proposed at $2.6 million, and increases year to year. The methodology for billing energy costs differs between GSU and HONI. While the overall composition is a combination of fixed costs (per unit) and variable costs (based on energy consumption), the proportion of fixed costs for streetlights serviced by GSU is significantly more than that of HONI. Therefore, a streetlight converted to LED would realize more savings if serviced by HONI as opposed to GSU.

Drivers for Proposed Course of Action

There is currently an opportunity for a funding incentive in the amount of $0.56 million from IESO. Staff estimate that a full conversion of the remaining HPS streetlights would result in 61% energy savings and an approximate $1.06 million energy cost savings annually.

III. Recommendation

Categorize your specific request (mark an 'X' for all that apply):

x	Change to base operating budget		Change to base FTE allocation
	Change to fees (unit price)		Change to revenues (volume change)
	Investment in project (Operating)	x	Investment in project (Capital)

Recommendation

The recommended change is to convert the remaining HPS streetlights to LED by entering into an agreement with AMO/RealTerm Energy in accordance with the report from the General Manager of Corporate Services dated November 29, 2019.

How does this align with Council's Strategic Plan?

	Asset Management and Service Excellence		Business Attraction, Development and Retention
x	Climate Change		Economic Capacity and Investment Readiness
	Housing		Creating a Healthier Community

In 2019, Council declared a climate emergency. A target of net zero greenhouse gas emissions by 2050 was directed by Council Resolution (CC2019-151). This is reaffirmed in the 2019-2027 City of Greater Sudbury Strategic Plan to build climate resiliency into existing programs.

IV. Impact Analysis

Qualitative Implications

The conversion of the remaining HPS/LPS streetlights would reduce greenhouse gas emissions by 61%.

Quantifiable Implications

The estimated annual energy cost savings would amount to $1.06 million annually. Net capital costs would amount to $6.15 million, including financing costs of $0.67 million.

Operating Revenue - Incremental

Detail

Description	Duration	Revenue Source		2020 $	2021 $	2022 $	2023 $	2024 $
Contribution from Reserve Funds	One-Time			$ (6,145,772)				
	On-Going			$ -	$ -	$ -	$ -	$ -
	One-Time			$ (6,145,772)	$ -	$ -	$ -	$ -
Total				**$ (6,145,772)**	**$ -**	**$ -**	**$ -**	**$ -**

Operating Expenditures - Incremental

Detail

Description	Duration	Funding Source		2020 $	2021 $	2022 $	2023 $	2024 $
Energy Costs	On-going				$ (1,059,479)			
Contribution to Reserve Funds	On-going				$ 1,059,479			
Contribution to Capital	One-Time			$ 6,145,772				
	On-Going			$ -	$ -	$ -	$ -	$ -
	One-Time			$ 6,145,772	$ -	$ -	$ -	$ -
Total				**$ 6,145,772**	**$ -**	**$ -**	**$ -**	**$ -**

Impact to Capital

Capital project estimate includes all costs associated with converting remaining 11,032 HPS/LPS streetlights to LED. Funds fully utilized in 2020 in order to realize incentive from IESO retrofit program.

FTE Table

Position	Bargaining Unit	Duration	Permanent / Part Time		2020	2021	2022	2023	2024
		Permanent			-	-	-	-	-
		PT Hours			-	-	-	-	-

Net Impact		2020 $	2021 $	2022 $	2023 $	2024 $
On-Going		$ -	$ -	$ -	$ -	$ -
One-Time		$ -	$ -	$ -	$ -	$ -
Total		$ -	$ -	$ -	$ -	$ -

Implementation

If approved, staff will commence the procurement as outlined in the information report from the General Manager of Corporate Services, dated November 29, 2019.

Advantages/Disadvantages

Advantages	Disadvantages
• Energy cost savings of approximately $1.06 million to be realized in 2027 after pay-back period.	• Capital costs would be internally financed from the Surplus Funds reserve fund as funds are currently not allocated to this project.
• Low energy consumption when compared to HPS and are more efficient by 40% to 60%. Direct lighting also contributes to lower light pollution.	• Luminance level higher than 10,000 cd/m2 causes visual discomfort whatever the position of the lighting unit in the field of vision.
• Reduced glare; Directing the light downward onto the roadway reduces the amount of light that is directed into driver's eyes.	• The initial cost of LED street lighting is high and consequently it takes several years for the payback before savings on energy are realized.
• Long and predictable lifetime: The projected lifetime of LED street lights is usually 15 to 20 years, two to four times the life of currently prevalent HPS.	• The increase in the blue and green content of artificial sky glow arising from widespread LED lighting is likely to increase impacts on bird migration and other nocturnal animal behaviours.
• More accurate color rendering: Improved color rendering makes it easier for drivers to recognize potential road hazards.	• The one for one replacement of LED for HPS could lead to dark patches and inadequate coverage on roadways and/or sidewalks as LEDs provide a very direct light relative to the broader spectrum of light emitted by HPS.
• Quick turn on and off: Unlike HPS, which take time to heat up once switched on, LEDs come on with full brightness instantly.	
• RoHS compliance: LEDs do not contain mercury or lead, and do not release poisonous gases if damaged unlike HPS.	

V. Alternatives

Alternatives Considered

Solution Options	Advantages/Disadvantages	Financial Impact
Remain Status Quo	The advantage of status quo is that the City would not have to incur the capital cost of the project and lighting coverage of HPS is more adequate. The disadvantage of status quo is that the City would forego energy reductions, operating savings and a project with a 6 year payback.	$ -
Strategic replacement of HPS to LED wherein the payback period is shortest and/or where lighting coverage is best.	The advantage of this would be to maximize the quantity of the return on investment and ensure that the negative effect on lighting quality of changing to LED lighting is minimized. The disadvantage is that the City may not be able to complete the full conversion in this manner and as a result, the City may not receive the full incentive amount.	