

LED Streetlight Conversion Program

ISSUE

Saskatoon Light & Power (SL&P) was the successful recipient of the federal government's Low Carbon Economy Fund – Champions stream funding for the replacement of existing High Pressure Sodium (HPS) fixtures with new Light Emitting Diode (LED) fixtures. SL&P would like to create a project to replace approximately 17,800 streetlight fixtures on roadways and park pathways.

RECOMMENDATION

That the Standing Policy Committee on Environment, Utilities and Corporate Services recommend to City Council that a capital project be created to replace high pressure sodium streetlights with light emitting diode streetlights, for a total estimated cost of \$6,116,000, with federal funding for the project up to \$2,446,367.11 of total eligible project costs.

BACKGROUND

SL&P has been leading the way in Saskatchewan with the installation of LED street lighting since 2010 when a pilot project was initiated in the Evergreen neighbourhood. Based on the success of that pilot project, in 2013 City Council approved the use of LED lighting for all new development areas and new roadway projects. As LED fixtures became more economical, individual fixture replacements have also been occurring throughout Saskatoon as fixtures fail. By the end of 2018, SL&P had installed 3,950 LED fixtures (14% of all lights operated by the utility).

In recent years, a large-scale conversion program from existing HPS fixtures to LED fixtures has been contemplated, but the significant capital investment required has limited SL&P's capacity to initiate the project. Replacing all non-LED fixtures is projected to cost more than \$13 million. As well, not all fixture types produce the same environmental or financial benefits.

An analysis indicated that the conversion program should first focus on changing existing cobra head-style street lighting used in residential and commercial areas, as well as along collector roadways and arterial roads. These non-decorative fixtures provide the biggest benefit both from an economic and environmental perspective. A total of 17,800 fixtures fall into this category, representing 66% of all lights operated by the utility. The estimated cost to replace these lights is approximately \$6.1 million. Changing these fixtures would increase our total number of LED fixtures to 21,750 (80%).

In the spring of 2018, Administration submitted an application for federal government funding through the Low Carbon Economy Fund – Champions stream fund to assist with the capital expenditure required to implement this project. On June 19, 2019, the

Administration was notified of successful receipt of federal funding equalling approximately 40% of the total project cost. This reduces a significant portion of the required capital investment and shortens the payback period for the project to less than five years. An agreement with the federal government must be signed within 45 days to receive the funding. Canada's contribution is subject to an execution of the funding agreement.

The purpose of this report is to gain City Council's approval to undertake this first phase of the conversion program to LED involving fixtures that provide the best return from both a financial and environmental perspective (cobra head-style lights).

Administration will continue to monitor the benefits of replacing the remaining 5,286 fixtures (20%). Most of these fixtures are decorative lights used downtown, and specialty fixtures used for high speed roadways, such as along Circle Drive, under overpass structures, in pedestrian tunnels, and flood lighting. At this time, the payback period for replacing these fixtures varies from 20 to 50 years based on the fixture.

DISCUSSION/ANALYSIS

Below is a table showing the breakdown of the number of fixtures that will be replaced for each classification.

<i>Roadway Classification</i>	<i>Current Fixture (HPS)</i>	<i>Replacement Fixture (LED)</i>	<i>Fixture Count</i>
Arterial	250 W	65 W	3,269
Collector	150 W	58 W	4,392
Local	100 W	34 W	8,605
Pathway	100 W	14 W	1,570
		Total	17,836

The LED fixtures that will be installed meet the City of Saskatoon (City) standards for roadway illumination, as well as light trespass and dark sky requirements. A light colour temperature rating of 3,000 degrees of Kelvin will be used.

The total cost of the replacement of 17,836 fixtures is estimated at \$6,116,000 (including taxes), with federal funding for the project up to \$2,446,367.11 (40% of eligible costs). Green Loan funding in the amount of \$3,670,000 will be paid back from operational savings over the following five years. By reducing the energy purchase requirement for street lighting, annual cost savings are expected to be approximately \$849,000 at full deployment. Once the loan has been fully repaid, ongoing cost savings that are achieved through the streetlight replacements will be re-invested to help fund SL&P's Asset Management Plan.

Replacing existing HPS streetlights with more energy efficient LED streetlights is identified in the Low Emissions Community Plan as a significant project impacting greenhouse gas (GHG) emissions. The City's Preliminary Low Emission Community Plan Initiatives also proposes changing streetlights to LED. By reducing the electrical energy consumed by more than 17,800 streetlights, electrical generation requirements

and corresponding GHG emissions are reduced by nearly 4,000 tonnes of CO_{2e} annually, which is the equivalent of removing more than 1,200 cars from the roadways.

The capital cost requirements to purchase LED fixtures has continued to drop in recent years making wholesale conversion programs more attainable. With the addition of the federal funding, the timing for this project can begin immediately.

NEXT STEPS

Upon approval of the project, Administration will establish the project and identify funding sources, including the Green Loan Application. The remaining funds (\$3,670,000) will be requested via a Green Loan Application; a separate report will be submitted to City Council for this approval. The Green Loan Application will be subject to Public Notice Hearing on Borrowing as per Policy No. C01-021, Public Notice Policy.

Following approval of funding and receipt of the federal funding, Administration will proceed with the procurement of the LED fixtures and tender the contracts for installation. A communication plan will be developed to advise citizens of the program and associated benefits. Completion of the project is expected by the end of 2021.

Report Approval

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