June 13, 2019

To: Members
Community and Protective Services Committee

Re: Solar Pathway Lighting Pilot Project

RECOMMENDATION

1. That the direction for Administration to undertake a pilot project to test solar LED lighting and conventional-power LED lighting along pathways be considered through the 2020 Budget process.

2. That Administration report back to Community and Protective Services Committee at the end of the five-year pilot project on its outcomes.

CONCLUSION

In response to a motion that was passed at the December 12, 2018 meeting of City Council, Administration has developed a pilot project to test solar lighting on a portion of the City's pathway system, consistent with the *Open Space Lighting Policy and Procedures (2006)*. Administration recommends the installation of LED solar pathway lighting along the multi-use pathway in Eastgate Park and a similar number of conventionally powered LED pathway lights along a portion of the multi-use pathway in Creekside Park for comparison. Administration would report back at the end of five years on the outcomes of the pilot project.

BACKGROUND

In 2006, Council approved the *Open Space Lighting Policy and Procedures (2006)* (Appendix A). This policy recommends that lighting be considered for the following:

- Major connectors (i.e pathways connecting schools or recreation facilities)
- Outdoor sports complexes
- Outdoor boarded ice facilities
- Parking lots serving open space facilities
- Tennis courts
- Special features, such as toboggan hills or outdoor seating areas
- Other areas as may be deemed appropriate by the Director

On December 12, 2018, Council approved a motion that, *"administration report back to the Community and Protective Services Committee in Q2 of 2019 with a proposed pilot project to test solar lighting on a portion of pathway that is consistent with the current Open Space Lighting Policy, along with proposed costs and financing, for consideration through the 2020 budget process*."

DISCUSSION

Administration proposes to undertake a five-year pilot project to test the capital, operations and maintenance costs along with the performance and lighting levels provided by 14 LED solar pathway lights against a control group of up to 10 LED pathway lights which make use of a conventional electrical power source.

Pilot Locations

The pilot locations were chosen based on their conformity with *Open Space Lighting Policy and Procedures (2006)*, the principles of Crime Prevention Through Environmental Design (CPTED) as well as requests from the community. The pilot locations evaluated include Toothill Park, A.E. Wilson Park, Stan Oxelgren Park, Bloos Park, Rae Park, Fines Drive Park, Creekside Park, Eastgate Park and Sangster Park. Background on the analysis of the considered locations and their consistency with the selection criteria is included in Appendix B. Maps of each park are included in Appendix C.

Administration's recommended location for the LED solar pilot is Eastgate Park, along the Pilot Butte Creek Multi-Use Pathway, from Thomson Avenue to Dewdney Avenue. The location for the LED conventional-power pilot is recommended to be Creekside Park directly north of Eastgate Park, also along the Pilot Butte Creek Multi-Use Pathway from Dewdney Avenue to McVeety Drive.

Both locations form part of the City's multi-use pathway network and are major connectors that act as high-traffic links between adjacent neighbourhoods, nearby schools and recreation facilities and commercial areas. As such, these locations are consistent with the policy. The Creekside pathway will also fill a gap between the existing lit pathway system in Parkridge Park and Dewdney Avenue. A map of the preferred pilot project locations can be found in Appendix C. Drawing S-6 Timing of installation is dependent on budget approval for this project but is anticipated to occur in spring 2020.

Water Security Agency Update

When Administration shared report IR18-18 with Council in December 2018, direction from the Water Security Agency (WSA) at that time was that they did not support permanent structures within the floodplain. This direction was problematic, as many municipal parks are located along creeks and storm channels. Administration has been working closely with the WSA to establish guidelines that would allow certain structures within the floodplain area. Recently WSA provided approval to the City allowing light standards to be installed within a floodplain, provided they are installed a minimum of five metres from the edge of the habitat zone along the creek. This has enabled Administration to bring forward locations along the Pilot Butte Creek Pathway, which would not have previously been considered as potential pilot locations, due to their location in the floodplain.

Pilot Criteria

Over the course of the pilot project, staff will monitor the effectiveness of the LED solar system against that of the LED conventional-power system based on capital, operation and maintenance costs. Along with component performance and lighting levels at various times of day, year and

weather conditions. The five-year duration of the monitoring period is half the typical design lifespan of most LED solar system batteries thus is intended to provide the City with a clear understanding of the batteries' long-term performance in Regina's climate.

RECOMMENDATION IMPLICATIONS

Financial Implications

Based on the capital, operating and maintenance costs previously reported to Community and Protective Services Committee and Council, Administration will propose the following be considered through the 2020 Budget process:

Capital Costs (2020)

Description	**# of Lights**	**Cost per light***	**Total**
LED Solar Power (Eastgate Park)	14	$6,380	$89,320
LED Conventional Power (Creekside Park)	10	$6,940	$69,400
Power Source (Creekside Park)		$15,000	$15,000
		Subtotal	**$173,720**
		Design Fees (10%) + Contingency (15%)	$43,430
		Grand Total	**$217,150**

*costs include: fixture, pole, pile and trenching and are based on estimates provided by lighting suppliers in our region.

Annual Maintenance Costs (2020 - 2025)

Description	**# of Lights**	**Cost per light / year**	**Total number of years**	**Total over 5 years**
LED Solar Power	14	$92	5	$6,440
LED Conventional Power	10	$37	5	$1,850
			Subtotal	**$8,290**
			Contingency (10%)	$ 829
			Grand Total	**$9,119**

Annual Operations Costs (2020 - 2025)

Description	**# of Lights**	**Cost per light (annually)**	**Total number of years**	**Total over 5 years**
LED Solar Power	14	$0	5	$0
LED Conventional Power	10	$20	5	$1,000
			Subtotal	**$1,000**
			Contingency (10%)	$100
			Grand Total	**$1,100**

Long-Term Financial Impact

The operating costs for the five-year pilot project are identified above, however, the planned life expectancy of the infrastructure will exceed the length of the pilot project by roughly 20 years. Based on the numbers above, the total cost to maintain and operate the pilot project infrastructure over the remaining 20 years of the lifecycle of the investment is as follows:

Annual Maintenance Costs (2020 - 2045)

Description	**# of Lights**	**Cost per light / year**	**Total number of years**	**Total over remaining 20 years**
LED Solar Power	14	$92	20	$25,760
LED Conventional Power	10	$37	20	$7,400
			Total	**$33,160**
			Contingency (10%)	$3,316
			Grand Total	**$36,476**

Annual Operations Costs (2020 - 2045)

Description	**# of Lights**	**Cost per light / year**	**Total number of years**	**Total over remaining 20 years**
LED Solar Power	14	$0	20	$0
LED Conventional Power	10	$20	20	$4,000
			Total	**$4,000**
			Contingency (10%)	$400
			Grand Total	**$4,400**

Over the 25-year lifespan of the investment, the higher capital and operating costs of the LED conventional-power lights are not offset by their lower annual maintenance costs. Based on the information above each LED solar light will result in a savings of $1,185 per light fixture over the 25-year lifespan of the infrastructure in comparison to the LED conventional-power option.

Environmental Implications

More than 50 per cent of Saskatchewan's electrical power currently comes from non-renewable energy sources. A transition to renewable energy for pathway lighting will contribute to a reduction in overall greenhouse gas emissions by the City.

Solar lighting is not without environmental impacts. Solar energy storage requires batteries, which have a shorter lifespan than components of a conventional power source, requiring periodic replacement. The batteries, depending on their design, can also contain chemicals and heavy metals which pose a risk to the environment if not recycled properly.

Policy and/or Strategic Implications

Park lighting installation is considered through the *Open Space Lighting Policy and Procedures (2006).* This document provides direction on when and where lighting should be considered. It also provides site evaluation tools when lighting is being considered. Administration will continue to use this policy to guide decisions on lighting installation, as well as Crime Prevention Through Environmental Design (CPTED) principles and any other applicable provincial legislation.

Other Implications

None with this report.

Accessibility Implications

The addition of lighting in the recommended locations will allow for better visibility during low light hours, thus increasing accessibility for the community.

COMMUNICATIONS

Prior to installation of the lighting for the pilot project, affected residents will be notified of the project construction schedule.

DELEGATED AUTHORITY

The recommendations contained within this report are within the delegated authority of Community and Protective Services Committee.

Respectfully submitted,

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Respectfully submitted,

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