Administration and Operations Committee Report

To:	To the Chair and Members of Administration and Operations Committee
From:	Adam Crozier, Project Manager, Office of the CAO
Date:	November 16, 2021
Subject:	RPT-21-305 – Street Lighting in Royal Highland Estates
Purpose:	For approval and for direction

Recommendation

Whereas the County of Brant has received concerns regarding issues with the streetlights located in the original portion of the Royal Highland Estates subdivision;

And Whereas staff have reviewed the street lighting system and recommend a full renewal based on the age and condition of the individual components;

That the County proceed with a renewal of the streetlights in the original phase of the Royal Highland Estates subdivision (Highland Drive, St. Andrew's Court, Brigadoon Court, Glengarry Court) with off-grid solar power fixtures as outlined as Option 3 in report RPT-21-305;

And that staff be directed to include this project in the draft 2023 Capital Budget with an amount of $495,750.

Strategic Priority

Strategic Priority 4 – Reliable Infrastructure

Financial Considerations

The Financial Considerations for the replacement of the street lighting network are discussed throughout the report and are based on the existing network of approximately 50 streetlights along Highland Drive, St. Andrew's Court, Brigadoon Court and Glengarry Court.

Background

At the September 21, 2021 meeting of the Administration and Operations Committee, Committee received a letter from a resident of Highland Drive expressing concern regarding the current state of street lighting in the Royal Highland Estates Subdivision (subdivision). As such, staff have reviewed the current state of the street lighting network and are providing information on relevant options available to address the concerns. Notably, this report does not address the streetlights in Phase 2 of Royal Highland Estates (Wingrove Woods and Wallace Court) which were more recently installed.

The exurban nature of the subdivision presents a unique challenge in the overall context of the County of Brant's street lighting portfolio. The vast majority of streetlights fixtures in the County were replaced through a conversion project undertaken in 2017 which focused solely on the replacement of the standard "Cobra head" street lighting fixtures but did not address any decorative or non-standard fixtures. Further complicating matters is that the road allowance in the subdivision is not subject to the same conditions requiring periodic major renewal projects (i.e. replacement of watermains, wastewater/storm outlets) which typically also address the main and costly components of a street lighting renewal project (wiring and poles) during the broader project. Finally, the vast majority of the street lighting system in the subdivision including underground wiring, poles and light fixtures are estimated to be original from its construction in the 1970s and maintenance costs and periods of interoperability have increased in recent years.

Report

Based on the age and condition of the overall lighting system including the poles, fixtures and the undergrounding wiring, it is recommended that the streetlights along Highland Drive, St. Andrews Court, Brigadoon Court and Glengarry Court be replaced with independently solar powered fixtures. Staff have outlined the potential options to address the concerns with inoperability below:

Option 1: Continue to Replace Lights as Needed

This option would see the County continue to provide maintenance on the existing streetlight fixtures, poles and wiring systems until a total failure occurs. Since May 2019 the County has expended approximately $10,600 on maintenance costs including the replacement of bulbs, photocells, ballasts, fixture heads and underground wiring. The current state of the poles is that they are worn and unsightly including poles that have 2 shades of dark paint on them, and many have trees that have grown around them which reduces their efficacy.

This option is not recommended based on the principles of asset management including increasing maintenance costs, and the concerns raised by residents regarding the reliability of the existing street lighting network.

Option 2: Replace Street Lighting Network – Grid Connected with New Poles, Fixtures, and Underground Wiring

This option would see a complete rebuild of the street lighting network with the replacement of all components including poles and fixtures, and the underground wiring system connecting to each pole and the electricity grid. The main cost associated with this option is the trenching and replacement of the underground electrical wiring, representing approximately 60% of the project cost. As the existing underground wiring is aluminum-based and has caused voltage spikes damaging the components of the streetlights in the past, the project should not proceed without a full renewal of the wiring systems.

Estimated Capital Cost: $602,500

Estimated Annual Operating Cost: $4,150 (Maintenance plus Electricity Cost)

Option 3: Replace Street Lighting Network – Off-Grid with New Poles and Solar-Powered Fixtures (Recommended Solution)

This option would see the existing network of poles and fixtures replaced with fixtures powered by a battery unit charged by a solar panel attached to the pole. The main cost associated with this option is the components that generate (solar panel) and store (battery) the energy required to power the streetlight. No trenching would be required to install the fixtures and any malfunctions would be isolated to the individual streetlight. Should additional lighting be requested, an individual pole and fixture can be independently installed as needed. As well, remote monitoring can be provided which can dim or increase the lighting as needed, and the status of a light can be determined without a site visit. Finally, the existing wiring system would be de-energized and left until a major renewal project occurred.

Estimated Capital Cost: $495,750

Estimated Annual Operating Cost: $2,850 (Maintenance minus Electricity Cost)

Staff recommend Option 3 as the preferred method to renew the street lighting network in the subdivision as it provides a solution to address concerns regarding the reliability of the existing network, a means to provide additional lighting if desired in the future, and as the capital costs are 21% less, and operating costs are 45% less than Option 2.

Due to ongoing supply chain issues staff recommend that this project be included in the draft 2023 Capital Budget to better ensure that the required materials are available to complete the project in whole. Staff will work to firm up details of the project in anticipation of the project commencing in 2023 and continue with required maintenance on the existing street lighting network until the project is completed.

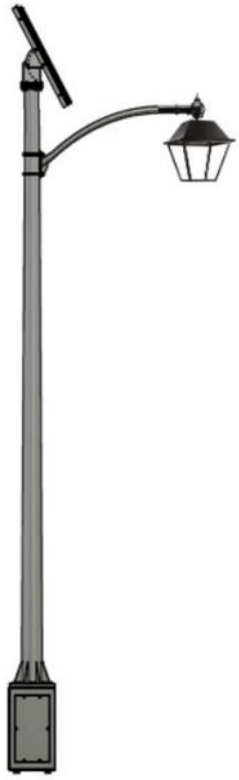

Figure 1: Visual Representation of Decorative Off-Grid Street Light Pole and Fixture

Environmental Impact

It is estimated that the current streetlights in the original phase of the subdivision consume 33,945 kWh per year, which represents 1,034 kg of GHGs annually.

The replacement of the current fixtures with new grid powered fixtures is expected to consume 14,400 kWh per year, which represents 333 kg of GHGs annually, and a reduction of 700 kg of GHGs from the existing network.

The replacement of the current fixtures with off-grid solar powered fixtures would represent an elimination of the existing GHG emissions.

Interdepartmental Considerations

The Roads Division oversees the maintenance of the County's street lighting network.

Attachments

None.

Copy to

1. Michael Bradley, Chief Administrative Officer
2. Greg Demers, Director of Roads
3. Sean Yacoub, Director of Renewable Energy, BME
4. Heather Mifflin, Director of Finance/Treasurer
5. Rick Knap, Roads Technologist

In adopting this report, is a bylaw or agreement required?

By-law required (No)

Agreement(s) or other documents to be signed by Mayor and /or Clerk (No)

Is the necessary by-law or agreement being sent concurrently to Council? (No)