

Attachment 1 - Pilot Project Information:

Pilot Project - Phase One - LED Evaluation

A comprehensive pilot project and evaluation process was completed from September 1, 2015 to May 30, 2016, to assess the viability of existing LED technologies currently on the market. The pilot project and evaluation were completed in partnership with FortisBC, who has been contracted to maintain the City of Kelowna's street lighting inventory, as well as their electrical sub-contractor, to leverage additional knowledge and expertise throughout the process.

City staff chose to limit the evaluation of LED fixtures to those that have been shortlisted by the B.C. government. The B.C. government has already performed an in-depth evaluation and competitive procurement process of LED lighting, and has put an agreement in place titled "LED Street Lights Across B.C.". A team of industry experts evaluated numerous LED manufacturers and their products on technical performance, and only those manufacturers who met the performance criteria and were willing to provide a ten-year warranty were eligible to be listed under the agreement. In addition, each of the manufacturers are required to provide competitive pricing to municipalities and can only adjust their pricing at pre-defined intervals throughout their contract with the provincial government.

During the evaluation, the following activities were completed:

- Compile and review the City's street light infrastructure inventory;
- Preliminary lighting design for each of the evaluated LED fixtures in the pilot locations;
- Energy use measurements to confirm that LED fixtures met the required light levels as expected;
- Technical review of energy costs, maintenance costs and available subsidies to calculate a reliable rate of return for a LED upgrade project. This review included working with FortisBC to confirm the energy billing (fixed and variable costs) of the project.
- Research of recommendations from organizations within the industry;
- Research of lessons learned by other municipalities who have converted from HPS to LED.

As a result of the technical review, it was determined that the current state of LED technology exceeds the current HPS standards and the LED street light marketplace has matured to the point that it is appropriate to support a business case for a major upgrade project.

Pilot Project - Phase Two - Adaptive Controls Evaluation

Part way into the LED technology review, City staff began a pilot project of a second technology, referred to as Adaptive Controls (controls), which would allow each individual LED fixture to be monitored and controlled. The purpose of this pilot project was to determine the viability of the controls technology, as well as assess the financial and

operational value of dimming and monitoring our street lighting infrastructure. Through a competitive RFP process, three adaptive controls companies were chosen to participate in the pilot project and showcase their technology.

Preliminary business case analysis of Phase two, the controls portion of the pilot, has proven not to be cost effective and is not included in this LED business case.

The results of the evaluation can be summarized into 5 main points.

1. Street light Design Optimization
 - a. Street light design can be optimized due to the ability to dim each individual fixture, allowing the appropriate light levels to be defined across the entire street light network.
2. Energy Savings
 - a. Additional energy savings of 20-30% could be achieved as a result of a comprehensive dimming schedule and the aforementioned design optimization.
3. Real Time Information and Notifications
 - a. Real time information from each fixture reduces operational costs. Alarms can notify maintenance staff when lights have failed and require service, streamlining the replacement and maintenance strategy currently in place. Real time information can also be provided to FortisBC to reduce utility costs.
4. Installation Cost
 - a. The installation cost of a controls technology can be almost entirely avoided if the controls are installed at the same time as the LED fixtures.
5. Return on Investment
 - a. Evaluating the adaptive controls project separately from the LED replacement project, the ROI on a controls project has been calculated at 10 years, assuming the controls are installed at the same time as the LED's. The controls equipment has a 10 year warranty, however the total lifespan of the equipment is unknown as the technology is so new.
 - b. If controls are not installed at the same time as LED fixtures, installation costs will be higher, increasing the ROI to 16 years.