

**STAFF REPORT: Engineering & Public Works Solid Waste Division**

**REPORT TO:** Infrastructure & Recreation Committee  
**MEETING DATE:** May 10, 2011  
**REPORT NO.:** EPW.11.039  
**SUBJECT:** Beaver Valley Community Centre Light Retrofit Project  
**PREPARED BY:** Adam McMullin, Environmental Initiatives Coordinator

**A. Recommendations**

THAT Council approve the creation of a capital budget for the Beaver Valley Community Centre Light Retrofit Project in the amount of \$65,000, as outlined in Report EPW.11.039 entitled "Beaver Valley Community Centre Light Retrofit Project".

THAT Council utilize gas tax to fund the proposed "Beaver Valley Community Centre Light Retrofit Project".

**B. Background**

The Beaver Valley Community Centre (BVCC) is the second largest consumer of energy of all Town owned or operated facilities behind the Craighleith Sewage Treatment Plant. Staff have conducted a investigation into a retrofit of the BVCC arena lighting system. The rink is serviced by 1100 watt metal halide light and fixtures that were installed during the construction of facility in 1993. An update to the current lighting system will provide energy and cost savings opportunities.

Staff propose replacing the current light and fixtures with high-efficiency fluorescent T-5 light and ballasts. The proposed lighting retrofit will include a management program to allow operational flexibility of the lighting system. Staff will be able to modify the lighting level based on the activity at hand. For instance, public skating typically requires a third of the illumination compared to a hockey game. Combining the improved efficiency of the fluorescent lighting with the enhanced operational capability of the system will reduce energy consumption and cost.

The current lighting system provides a near uniform 75 foot-candles of illumination at the ice surface. The high quality of lighting of BVCC is a major factor in attracting the NHL officials camp and other users to the facility. The lighting retrofit must be able to meet or exceed the existing foot-candle illumination at the BVCC when required.

**Investigation**

Staff from Recreation and Engineering & Public Works departments conducted site-visits to the Southampton, Dundalk and Mount Forrest arenas, all of which have installed new lighting systems within the past 5 years. The following summarizes the details of these systems:

*Southampton*

- 18 fixtures
- 12 + 2 T5 florescent tubes (two 6-blub lighting fixtures facing towards the ice surface, two lights on top of fixture facing the roof)
- 54 watts per tube/764 watt per fixture
- 24 feet from ice surface
- extruded anodized aluminum fixture
- ice surface foot-candle illumination of 80 directly below lights and 72 between lights

*Dundalk*

- 32 fixtures
- T5 florescent tubes (6 bulb)
- 54 watts per tube/324 watt per fixture
- 16 feet from ice surface
- square metal fixture
- ice surface foot-candle illumination of 45 directly below lights and 40 between lights

*Mount Forrest*

- 28 fixtures
- T5 florescent tubes (10 bulb)
- 54 watts per tube/ 540 watt per fixture
- 28 feet from ice surface
- ice surface foot-candle illumination of 73 directly below lights and 67 between lights

**Findings**

The Southampton lighting system had the best illumination and functionality. Mount Forest lighting system is augmented by natural light during the day, but did not have the operational capabilities of the Southampton system. Dundalk had the lowest light quality, as the fixtures are close to the ice surface and are obstructed by the square metal fixtures. The Dundalk lighting system had limited functionality. Dundalk Staff were not satisfied with their lighting system.

Southampton Staff indicated that the system has produced approximate savings of \$1000 per month during the first 6 months of operation of the retrofit. The operational capability of the system is the major driver of the energy savings because it allows lighting levels to be planned and adjusted for each type of use.

Based on these findings, Staff have investigated the potential cost and pay-back benefit of retrofitting the BVCC with the same type of lighting system installed at Southampton. These are outlined in the Financial Impact section of this report.

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The proposed light retrofit will reduce annual energy consumption and improve operational cost efficiencies and enhance flexibility of the arena lighting system. Staff recommend proceeding with the BVCC light retrofit in 2011 prior to the planned ice installation on August 12, 2011.

**C. The Blue Mountains’ Strategic Plan**

Energy management, conservation and reduction will assist the municipality achieving Strategic Plan Goal # 3“Preserving and enhancing natural and environmental features, and cultural heritage of the community”.

**D. Environmental Impacts**

Reducing energy consumption corresponds with a reduction in greenhouse gas emissions.

**E. Financial Impact**

The anticipated cost and installation for the light retrofit is \$65,000 (\$55,000 for materials, \$10,000 for installation).

Pay-Back Calculation

Fixtures: 24  
 Operating Hours: 2,500  
 Average Cost per kWh: \$0.095

The retrofit will have a payback of 9.18 years. The lights have an operational life expectancy of 30,000 hours or 12 years. The simple payback calculation is conservative, it does not consider rising energy prices and utilizes a 50% operational savings adjustment, much lower than identified by Southampton staff, who estimate a 75% energy reduction due to operational efficiencies.

<b>Pay-Back Factors</b>	<b>Existing</b>	<b>Proposed</b>
Input Watts Per Fixture	1100	756
Power Factor	0.7	1
Power Factor Adjustment	1,571	756
Operating Hours per Year	2,500	2,500
kWh per year	3,929	1,890
Annual Cost per fixture	\$373.21	\$179.55
Operational Savings (50%)	n/a	\$89.78
Annual System Cost	\$8,957.14	\$2,154.60
Annual Savings	\$6,802.54	
Collus Rebate (\$105/fixture)	\$2,520.00	
Installation Cost	\$65,000.00	
Final Cost	\$62,480.00	
Simple Payback (Years)	9.18	

At current electricity rates, the retrofit will reduce annual operating costs by \$6,800.

Gas Tax Funding

As of year-end 2010, the gas tax funding surplus reserve is \$288,382.74. Staff propose the use of gas tax to fund the lighting retrofit project. Financial Services has reviewed the light retrofit initiative and is in favour of the allocation of gas tax for this use.

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**F. Attached**

None.

Respectfully submitted,

***Adam McMullin***

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***Reg Russwurm***

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