

**Environment & Sustainability Standing Committee**  
**May 2, 2013**

**TO:** Chair and Members of Environment & Sustainability Standing Committee

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**SUBMITTED BY:** \_\_\_\_\_  
Jane Fraser, Director, Planning and Infrastructure

**DATE:** March 6, 2013

**SUBJECT:** **HRM LED Streetlight Conversion Project**

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**ORIGIN**

On May 15, 2012, the Halifax Regional Council passed a motion stating that Halifax Regional Council direct staff to:

1. Develop an implementation plan for taking ownership and converting all municipal streetlights to Light Emitting Diode (LED) technology in accordance with recent amendments to the *Energy-Efficient Appliance Act*; and
2. That the Streetlight Conversion Plan be approved by Regional Council prior to implementation.

**LEGISLATIVE AUTHORITY**

1. Energy-efficient Appliances Act, as amended (September 10, 2012 ) N.S. Reg.172/2012; and
2. HRM Charter, Power to expend money, 79(1)(n) lighting any part of the Municipality

**RECOMMENDATION**

It is recommended that the Environment and Sustainability Standing Committee recommend to Regional Council that the Halifax Regional Municipality (HRM):

1. Purchase all Nova Scotia Power (NSP) owned outdoor lights directly servicing the municipality, using a stranded asset valuation approved by the Nova Scotia Utility and Review Board (NSUARB);
2. Direct staff to communicate to the Department of Energy the implementation plan and solicitation strategy before June 30, 2013; and
3. Direct staff to initiate the procurement process and solicitation strategy required to assess and award contracts for the optimal service delivery model.

## **BACKGROUND**

In June 2011, the province amended its Energy Efficient Appliances Act to include streetlights among the list of energy inefficient appliances in Nova Scotia. In September 2012, the Department of Energy released regulations around acceptable replacement technologies and the required implementation time period. Municipalities are obligated to convert all streetlights to LED by December 31, 2022. Provincial regulations require all municipalities to submit an implementation plan by June 30, 2013.

Number of Streetlights (rounded):	40,500 in entire municipality
	28,500 owned by Nova Scotia Power
	12,000 owned by HRM.

Municipalities must pay NSP for any remaining value in the fixtures the utility owns, regardless of who replaces them with LED technology. On a prorated basis, HRM will be expected to pay NSP \$5.1 million.

Municipalities have the opportunity to examine the comparative economics of financing the purchase of new streetlights and taking ownership of all streetlights in their jurisdictions, or paying for them through a monthly capital rate which is included in the Full Service Unmetered Streetlight Rate. The May 15, 2012, Recommendation Report to Regional Council, concluded that taking ownership of streetlights within the municipality would save HRM approximately \$20 million over the life of the new LED streetlight fixtures. The resulting motion directed staff to develop an implementation plan.

## **DISCUSSION**

Nova Scotia Power requires municipalities that choose to purchase their lights to “sign an agreement for the transfer of assets”. This option will require HRM to take over maintenance as soon as assets are transferred to the municipality. NSP has indicated in its offer to municipalities that the purchase cost will be adjusted to reflect additional depreciation, LED additions, and High Pressure Sodium retirements, to the transfer date. Additionally, Municipalities purchasing streetlights must purchase the inventory of other park lighting. This figure is included in HRM financial implications.

**Purchase Nova Scotia Power owned Streetlights:** HRM is obligated to pay NSP for the stranded value attached to the existing non-LED streetlights within the municipality that the utility now owns. The NSUARB has ruled (2013 GRA Decision) that the utility is allowed to recover the Net Book Value of the streetlight asset pool. On August 23, 2012, HRM’s portion of that asset’s valuation has been calculated to be \$5,082,256. This amount reflects the remaining value in the 28,552 fixtures NSP owns and maintains in the municipality. The valuation will change as a result of NSP replacing or adding any new LED fixtures to the asset pool.

**Timing for Purchasing Existing Streetlights:** The Nova Scotia Department of Energy Regulations respecting the conversion of streetlights requires all municipalities to confirm their intentions "... to take ownership of any non-high mast roadway lights owned by NSP..." by June 30, 2013.

NSP have stated that municipalities which chose to purchase their lights will be required to sign an agreement for the transfer of assets and that they will continue to service lights that require repair until the purchase is finalized. NSP has also agreed that a purchase could be transacted based on "billed quantities", should a municipality wish to take ownership before final quantities are established, with a final reconciliation undertaken once the inventory project was concluded.

While the timing to commit to a purchase decision is fixed through provincial legislation, the date for actual takeover of assets and responsibility to maintain them and convert them to LED is less clear. HRM does, however, have two other drivers which should impact a purchase decision:

- Cost of leasing NSP fixtures; and
- Spot conversion protocol

HRM pays NSP approximately one million dollars annually to lease streetlights from them. Based on the billed quantity of NSP owned fixtures, and an adjustment to reflect a 2013 sale, a purchase of NSP streetlights would have a simple payback of approximately 5 years.

With respect to spot conversion protocol, NSP is obligated to convert a streetlight to LED whenever they are called to repair/replace a fixture. This includes instances where a bulb replacement or photocell replacement would suffice. Based on the anticipated bulb burn-out rates for HPS bulbs, this could amount to approximately 575 bulbs each month. HRM was granted a deviation from the regulation and only has to replace non LED fixtures with LED fixtures when the fixture fails. For the same service area, applying HRM's approach, the number of spot conversions would be reduced to approximately 120 bulbs per month. The fewer spot conversions the more efficient and effective the mass conversion will be to roll out, and the fewer single LED fixtures will be operating on streets which are largely HPS fixture lit.

**Maintenance/Service Level:** NSP owns and maintains approximately 28,500 streetlights in HRM. Through the Unmetered Rate, the municipality pays NSP approximately \$1.4 million annually as a maintenance charge. The approach which NSP has taken to streetlight maintenance has been a reactive one, whereby the utility responds to outage requests "usually within 7 business days". NSP's service territory covers urban, suburban and rural areas of the municipality. HRM proactively maintains approximately 12,000 streetlights, using contracted services to relamp fixtures on a 5 year cycle and respond to outage requests with a three day turn around target. HRM's service territory is largely urban.

In taking over maintenance of the existing NSP streetlight territory, HRM will be tripling the number of streetlights under its responsibility. This will necessitate a commitment to managing streetlight service across the entire municipality. Because the existing non-LED streetlights must all be converted before December 31, 2022, a maintenance protocol needs to recognize that the number of fixtures being maintained annually will be reduced, likely as much as by 20% each

year. Replacement LED fixtures are anticipated to have a very low maintenance requirement due to the 20 year life expectancy, as compared to the 4 to 5 years for HPS lamps.

**Optimizing the Conversion to LED:** On May 15, 2012, Regional Council directed staff to “Develop an implementation plan for taking ownership and converting all municipal streetlights to LED technology, in accordance with recent amendments to the Energy-Efficient Appliances Act”.

**Baseline Business Case:** Staff has completed preliminary work required to assemble the shadow bid and prepare financial implications for an internal service delivery model. Work is based on logical and conservative assumptions of an internal streetlighting service delivery, including:

- Identifying the financial incentive to take over NSP owned streetlights sooner than later due to the asset lease costs and the lesser regulatory direction related to spot replacements on the municipalities;
- Balancing service delivery standard between the HRM standard and the Nova Scotia Power challenge of maintaining streetlights in the largest geographic municipality in Canada;
- Analyzing the option of HRM ownership instead of Nova Scotia Power continued ownership;
- Staffing impacts;
- Sensitivity on financial implications related to price reductions;
- Sensitivity on financial implications related to rising energy costs.

The baseline HRM business case would result in an implementation start in 2014/2015 with a five year implementation phase. The baseline business case assumes the technology lifecycle risk with only a 2% outage rate and minimizes assumptions related to price reductions.

**Procurement Strategy:** The proposed procurement strategy for the LED Streetlight Conversion will consist of the following:

- Step 1: Development of a Service Standard, Scope of Work, Technical Requirements and Evaluation Criteria;
- Step 2: Issue a Request for Proposals for a Design, Build, Operate and Maintain contract to outsource the service delivery of streetlighting;
- Step 3: Develop a shadow bid with HRM staff, and contractors, providing service delivery of streetlighting;
- Step 4: Evaluate RFP submissions and HRM shadow bid; and
- Step 5: Either award DBOM contract or cancel RFP and proceed with HRM tender for fixtures and associated staffing actions.

**Risk:** The two fundamental risks associated with the business case of LED Streetlighting, as required by legislation, are:

1. The technology assumption of the 20 year lifecycle; and

2. The risk of making technology investments now with the expectation prices could dramatically drop during implementation period.

The solicitation process will identify the cost of risk transfer for service delivery. The RFP process will enable innovative and collaborative partnerships to share that risk, which staff can compare to the cost of taking on the risk through internal service delivery in the shadow bid.

**Adaptive Lighting Technology:** With the full scale switch to LED technology, an opportunity exists to include streetlight monitoring capability as new fixtures are being procured. Adaptive lighting technology provides a wireless streetlight monitoring and control system, which enables the system manager to:

- Identify when lights are not operational;
- Monitor energy usage;
- Provide dimming capability;
- Maintain light levels over time;
- Provide outage reports on a daily basis using GPS locates; and
- Provide outage repair/replacement planning optimization and record management.

The predicted outcomes of adopting adaptive lighting technology include lower energy costs, improved public service, and precise benchmarking and reporting.

## **FINANCIAL IMPLICATIONS**

The implementing of the amendment to the Energy-Efficient Appliances Act, to include existing streetlights, will have a significant budget impact on HRM. This legislation requires all municipalities to switch streetlights to LED technology, regardless who owns the fixtures. The capital cost will total approximately \$40 million by the time the conversion to LED is completed (which is anticipated by 2019). This will be offset, when the conversion is completed, by annual operational savings which include a 50% energy reduction (which is included in the new rate) and maintenance frequency reduction from 20% to 2% annually.

### ***Capital Costs:***

The capital cost proposed for the 2013/14 project budget for **Project No. CT000005 – LED Conversion of HRM Streetlights**, is estimated to be \$8 million. This includes the original stranded asset inventory estimate of \$5.1 million (valued at January 1, 2012), plus a net of \$2.8 million for new streetlights estimated to be converted to LED by NSP by the time of transfer, less depreciation. This will be funded by the proposed **LED Street Light Conversion Reserve (Q327)**.

An additional \$32 million will be required to convert the remaining streetlights to LED over a 5 year period. This will be funded by debt financing outside the HRM Debt Policy. That is, the debt will be repaid from realized operational savings instead of the general tax rate.

	(Million dollars)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
<b>Capital costs:</b>												
Stranded Assets	\$	7.95										
LED Conversion	\$	-	\$ 5.27	\$ 5.27	\$ 5.27	\$ 5.27	\$ 5.27	\$ -	\$ -	\$ -	\$ -	\$ -
Adaptive Lighting System	\$	-	\$ 1.48	\$ 0.92	\$ 0.92	\$ 0.92	\$ 0.92	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Project Account No. CT000005</b>	<b>\$</b>	<b>7.95</b>	<b>\$ 6.75</b>	<b>\$ 6.19</b>	<b>\$ 6.19</b>	<b>\$ 6.19</b>	<b>\$ 6.19</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

***Operating Savings:***

As street lights are converted to LED technology, the annual operational maintenance cost is anticipated to decline each year thereafter by 50% to 90% over the projected current stated cost, for a potential savings of \$1 to \$5 million annually. These savings will be allocated to the proposed LED Street Light Conversion Reserve Q327. Savings accumulated in the reserve will be used to reduce the actual debt funding required, as well as repay the debenture over its term.

	(Million dollars)	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
<b>Operating costs:</b>												
<b>Current State</b>												
NSPI inventory (28,500)	\$	4.88	\$ 5.03	\$ 5.18	\$ 5.33	\$ 5.49	\$ 5.66	\$ 5.83	\$ 6.00	\$ 6.18	\$ 6.37	\$ 6.56
HRM inventory (12,000)	\$	1.31	\$ 1.34	\$ 1.38	\$ 1.42	\$ 1.46	\$ 1.50	\$ 1.54	\$ 1.58	\$ 1.62	\$ 1.67	\$ 1.72
<b>Total Current Operating Costs</b>	<b>\$</b>	<b>6.18</b>	<b>\$ 6.37</b>	<b>\$ 6.56</b>	<b>\$ 6.75</b>	<b>\$ 6.95</b>	<b>\$ 7.15</b>	<b>\$ 7.36</b>	<b>\$ 7.58</b>	<b>\$ 7.81</b>	<b>\$ 8.04</b>	<b>\$ 8.27</b>
<b>Proposed State</b>												
HRM inventory (40,500)	\$	6.18	\$ 4.53	\$ 4.15	\$ 3.75	\$ 3.32	\$ 2.87	\$ 2.56	\$ 2.63	\$ 2.71	\$ 2.79	\$ 2.87
<b>Total Proposed Operating Costs</b>	<b>\$</b>	<b>6.18</b>	<b>\$ 4.53</b>	<b>\$ 4.15</b>	<b>\$ 3.75</b>	<b>\$ 3.32</b>	<b>\$ 2.87</b>	<b>\$ 2.56</b>	<b>\$ 2.63</b>	<b>\$ 2.71</b>	<b>\$ 2.79</b>	<b>\$ 2.87</b>
<b>Annual Savings</b>	<b>\$</b>	<b>-</b>	<b>\$ 1.84</b>	<b>\$ 2.40</b>	<b>\$ 3.00</b>	<b>\$ 3.62</b>	<b>\$ 4.29</b>	<b>\$ 4.80</b>	<b>\$ 4.95</b>	<b>\$ 5.10</b>	<b>\$ 5.25</b>	<b>\$ 5.41</b>

**COMMUNITY ENGAGEMENT**

Prior to taking ownership of NSP owned streetlights, a communications plan will be developed to notify the general public that the HRM will be the streetlight service provider from a turn-over date onward, as well as options for reporting outages and anticipated service level expectations.

**ALTERNATIVES**

Because the Province of Nova Scotia has modified its *Energy Efficient Appliances Act* to include streetlights, HRM is required to replace all its fixtures. As a result, there is no alternative to converting streetlights. However, as indicated, there are several ownership alternatives which require consideration.

**ATTACHMENTS**

None

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A copy of this report can be obtained online at <http://www.halifax.ca/commcoun/cc.html> then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

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