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<b>TO:</b>	<b>CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON MAY 20, 2015</b>
<b>FROM:</b>	<b>EDWARD SOLDI, P. ENG. DIRECTOR, ROADS &amp; TRANSPORTATION</b>
<b>SUBJECT</b>	<b>TRANSPORTATION ENERGY OPTIMIZATION PLAN (TEOP) PHASE 1 FINANCING</b>

<b>RECOMMENDATION</b>
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That on the recommendation of the Director, Roads & Transportation, the following actions **BE TAKEN** with respect to the implementation of Phase 1 of the LED Street Light Upgrade Program:

- (a) the financing for this project **BE APPROVED** as set out in the Source of Financing Report attached hereto as Appendix A; and
- (b) that Civic Administration **BE DIRECTED** to issue a Request for Proposal for the supply and install of LED street lights, from the City’s pre-approved manufacturers list, for Phase 1 of the LED Street Light Upgrade Program.

<b>PREVIOUS REPORTS PERTINENT TO THIS MATTER</b>
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For additional information, please refer to the following committee reports:

1. October 19<sup>th</sup>, 2009: Environment and Transportation Committee “Alternative Street Lighting Technology Review”
2. October 18<sup>th</sup>, 2010: Environment and Transportation Committee “Alternative Street Lighting Technology Review – Update –“;
3. April 28<sup>th</sup>, 2014: Civic Works Committee “Transportation Energy Optimization Plan (TEOP)”; and
4. December 16<sup>th</sup>, 2014: Civic Works Committee “Transportation Energy Optimization Plan (TEOP) Update”

<b>BACKGROUND</b>
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In December 2014, the Civic Works Committee received an update on the Transportation Energy Optimization Plan (TEOP). This report addresses the financing of Phase 1 of the program which includes upgrading 9,700 street lights from High Pressure Sodium (HPS) to LED along major roads.

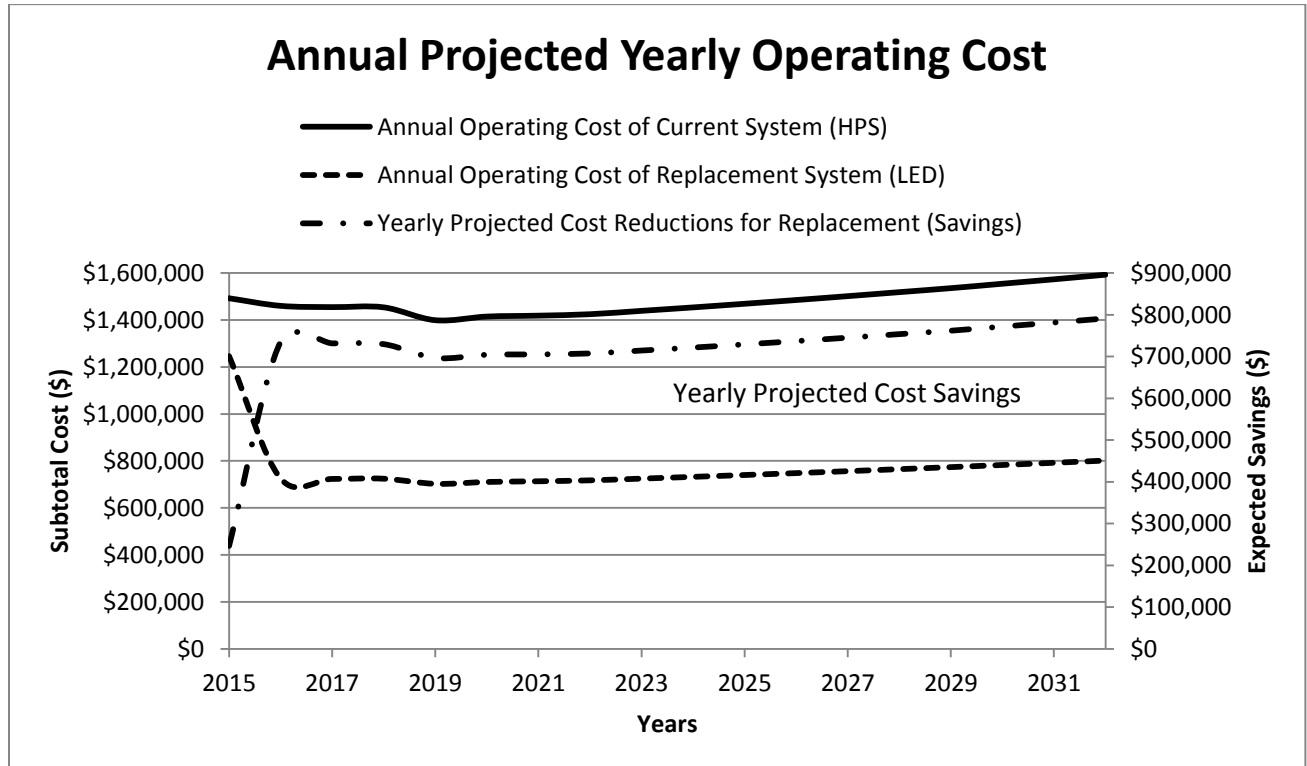
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The TEOP initiative is identified in the Strategic Plan for the City under Building a Sustainable City – Strong and Healthy Environment. The initiative is integral to the “Implement innovative ways to conserve energy” strategy.

**DISCUSSION**

Energy Savings

London Hydro and city staff reviewed the energy consumption before and after the Phase 1 LED street light upgrade project and the annual energy savings is expected to be between \$675,000 and \$740,000. The following graph from London Hydro shows the anticipated energy savings based on the best available price projections.



It should be noted that the City will start realizing the energy savings on a monthly basis as the LED upgrade program is installed in the field rather than waiting for the completion of the upgrade. In addition to the energy savings the LED street light upgrade should also reduce some of the annual maintenance costs by \$65,000. The total annual savings associated with this project is expected to be \$740,000 to \$805,000.

Project Implementation

The work done to date in developing the business plan confirmed that Phase 1 (major roads) of the LED Street Light Upgrade is both a financially and environmentally sound program. The next step in the program is the issuance of a Request for Proposals (RFP) for the supply and installation of the LED street light fixtures. The RFP will include the following components:

1. Engineering and Contract Administration of the LED upgrade.
2. Forty-seven (47) photometric designs to the ANSI/IESNA RP-8-14 standard for

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roadway lighting. These designs will then be applied throughout the City.

3. Supply and installation of LED street light fixtures from one of the following manufacturers which have been reviewed, tested and accepted for use by City staff:
  - a. American Electric Lighting – Autobahn
  - b. Cree – XSP, XSPR and LEDway
  - c. Cooper Lighting – OVH
  - d. LED Roadway Lighting – Satellite and NXT
  - e. Philips Lumec – Roadstar and Roadview
  
4. Twice monthly updates showing the location, wattage of HPS fixture removed and wattage of LED fixture installed in a format suitable for importing into the City’s existing database.
  
5. The environmentally sound disposal the old HPS fixtures.
  
6. An incentive and disincentive clause to help ensure the City achieves the expected energy savings as soon as possible.

It is anticipated that work on the installation of the LED street lights will begin in September with completion by June 2016.

Financial Impacts

The estimated cost for Phase 1 of the LED street light upgrade is \$6,000,000 which includes contract administration. Confirmation has been received from London Hydro on behalf of the Ontario Power Authority (OPA) that London would be eligible for an incentive of \$1,323,486 to be applied toward Phase 1 of the upgrade. The net cost to the City would be \$4,676,514 for Phase 1 which will be self-financed by borrowing from the Efficiency, Effectiveness, and Economy Reserve at the City’s internal borrowing rate which is the bank prime lending rates less 1.60%. Currently the bank prime lending rate is 2.85% which would result in an internal borrowing rate of 1.25%. The amount borrowed from this reserve will be paid back with interest through the annual savings realized in energy and maintenance costs which is estimated to be between \$740,000 and \$805,000. The estimated payback period for Phase 1 is between 6 to 7 years, assuming annual savings of \$740,000 and an internal borrowing rate of 1.25%.

	Total Repayment	Interest	Principal	Balance
Net Cost of Phase 1				4,676,514
2016	740,000	54,538	685,462	3,991,052
2017	740,000	45,921	694,079	3,296,973
2018	740,000	37,195	702,805	2,594,168
2019	740,000	28,359	711,641	1,882,527
2020	740,000	19,413	720,587	1,161,940
2021	740,000	10,353	729,647	432,293
2022	434,105	1,812	432,293	-
<b>TOTAL</b>	<b>4,874,105</b>	<b>197,591</b>	<b>4,676,514</b>	

Once paid back, the annual savings could be used to help fund future phase(s) of the upgrade project. It should be noted that London Hydro has concurred with the estimated energy cost savings.

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<b>CONCLUSIONS</b>
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Replacing the current HPS street lights with LED street lights along major roads is a cost effective program with a 6 to 7 year payback. Energy savings will be used to finance Phase 1 of the upgrade program. A Request for Proposals (RFP) will be issued for the Supply and Installation of the LED Street Light Fixtures for Phase 1 of the program. Implementation of Phase 2 will occur after Phase 1 is complete and energy savings are achieved to finance the next phase.

The following is a summary of the estimated costs and incentive for Phase 1:

Supply and Installation of LED street light fixtures for Phase 1 of the upgrade	\$6,000,000
London Hydro Incentive	\$1,323,486
<b>Net Cost to the City</b>	<b>\$4,676,514</b>
<b>Expected Annual Savings</b>	<b>\$740,000 to \$805,000</b>

**Acknowledgements**

This report was prepared with the assistance of the Financial Business Administration Division and London Hydro.

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<b>RECOMMENDED BY:</b>	<b>REVIEWED &amp; CONCURRED BY:</b>
<b>EDWARD SOLDI, P.ENG. DIRECTOR, ROADS AND TRANSPORTATION</b>	<b>JOHN BRAAM, P.ENG. MANAGING DIRECTOR ENVIRONMENTAL &amp; ENGINEERING SERVICES AND CITY ENGINEER</b>

Attach: Appendix A – Source of Financing  
Appendix B – Letter from London Hydro

cc. P. Shack, Tangible Capital Assets  
London Hydro