



# **CITY OF WELLAND & WELLAND HYDRO**

## ***LED Conversion Program***

***Lighting the Way Forward to a Green Community***

***October 7, 2008***

***Councillor David Alexander***

***City of Welland***



# City of Welland



# Traffic Signals

- 2005 and 2006, the Corporation of the City of Welland and Welland Hydro partnered together to complete the conversion of all existing incandescent traffic signals to Light Emitting Diodes (LED's)
- Welland Hydro willing to cover 25% of the costs
- Due to success and funding available, this cost increased to 60%.
- Overall this reduced power consumption specific to traffic signals by 66%.

Intersection	Incandescent Power Consumption (watts)	LED Power Consumption (watts)	Reduction In Power Consumption (watts)
Broadway at Canal Bank	1092	364.8	717.2
Plymouth at Ontario	928	365	563
Denistoun at Lincoln	1120	319.8	509.2
Crowland at Lincoln	1382	356.4	1025.6
First at Thorold	442	316.4	125.6
Hellems at Lincoln	1262	356.4	905.6
Fitch at Willson	1262	356.4	905.6
Ontario at Southworth	1262	356.4	905.6
Crowland at Hagar	1905	581	1324
King at Lincoln	2195	793	1402
King at Ontario	1385	641	744
King at Regent	670	292.4	377.6
Lincoln at Welland Canal	670	292.4	377.6
Ontario at Wright	1262	356.4	905.6
Total Watts	16827	5747.8	11079.2
Costs \$ per month	970	331	639
Cost \$ per year	11640	3972	7668

# Street Lighting

- Inventory base of 6573 streetlights
- Total power consumption cost is \$372,677/year
- Maintenance and capital costs is \$178,952.85/year



# LED Street Lights

- 2007, the City of Welland released an RFP for the supply of 50 LED streetlights.
- Four companies submitted proposals for review and consideration.
- City Council approved the contract to Lumecon LLC.
- Installation took place on Fitch Street, between South Pelham Road and Prince Charles Drive
- Designated as a minor collector roadway
- On October 31, 2007, Welland Hydro began the installation of 47, 90 watt LED streetlights to replace 150 watt HPS streetlights
- [Video](#)



# Third Party Testing Public Survey

- Between December 5, 2007 and February 23, 2008, an online survey was available through the City of Welland and greenTbiz websites.
- January 22 & 23, 2008 a door-to-door survey was conducted.
  - 74 door-to-door surveys were completed
  - 123 online surveys were attempted
  - 73% of all respondents preferred the new LED streetlights, 17% preferred the HPS and 10% had no preference
  - cited reasons for LED preference included energy savings, cost savings, brighter light, whiter colour and decreases glare
  - negative responses included LED not bright enough and decreases visibility, produces a patchy distribution along road, sidewalk and yard.
  - 36.5% believed lighting had improved and 36.5% believed it had not improved.
  - 44% believed that the quality of light had improved through less glare, improved colour, increased brightness and visibility

# Third Party Testing

## On-site Light Testing

- February 21, 2008, Lighting Sciences was contracted by greenTbiz to complete lab and on-site testing
- Lighting Science completed lab testing in late January 2008 on both the R20 and R30 models after 1000 hours of use and compared them to a new R20 fixture.
  - The luminaries are classified as Type III, very short.
  - As the luminaries have a full cut-off rating, they are Dark Sky compliant.
  - Lumen output is relatively low for a roadway luminaire.
  - Luminaire contains 24 CREE XRE LEDs contained within, running at 1 amp
  - The correlated colour temperature (CCT) is 7000K, this result in the device being relatively close to daylight.
  - There was no lumen depreciation at 1000 hours
  - There was an acceptable increase in lumens at 1000 hours.
  - The R20 model, the CCT shifted from 5991K to 7005K

# Full System Conversion

- LED streetlights reduced power consumption by 5255 watts per day (52%) and resulted in a yearly savings of \$1816.
- Initial purchase costs for LED can exceed HPS costs by double or triple the amount.
- Projected that the lifespan of an LED fixture is 15 years, however, due to the cold weather conditions of Canada, it is expected that the LED product could exceed 20 years.
- When an analysis is completed comparing both products over the potential life span of the LED, substantial savings are expected for both maintenance and energy (\$20,806,141) by utilizing an LED product
- Utilizing the City of Welland's inventory of 6573 streetlights, the cost to retrofit the entire system utilizing HPS products (including cobra head) is \$1,446,060 and \$3,615,150 for LED products.
- Buy back on the initial investment would be between 3 and 4 years.

# Support



NIAGARA CENTRE,  
ROYAL ASTRONOMICAL SOCIETY OF CANADA  
P.O. Box 4040  
St. Catharines, Ontario  
L2R 7S3

Mr. David Ferguson  
Manager of Traffic  
60 East Main Street  
Welland, Ontario  
L3B 3X4

re. LED streetlights

Dear Mr. Ferguson:

I am writing on behalf of the Niagara Centre of the Royal Astronomical Society of Canada (RASC) regarding the installation of LED streetlights along Fitch Street.

We would like to congratulate the City of Welland for this initiative. Our members support the goal of minimizing light pollution and replacement costs.

In addition, as astronomers who are very interested in the potential of LED streetlights, we are concerned about light pollution.

You may know that an estimated 30% of the energy used in North America is wasted, mainly because of inefficient lighting and/or is unnecessarily intense. Unshielded lighting wastes electricity but also cause annoyance and trespass, glare, and trashy and confusing light environments.

Niagara Centre, RASC Website: [www.astronomyniagara.org](http://www.astronomyniagara.org)

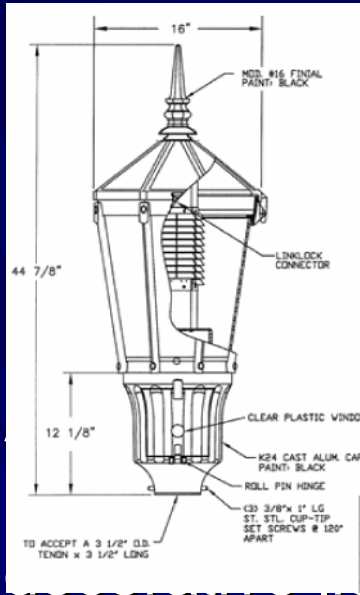


# Street Lighting

## City of Welland

- The City of Welland currently does not have a detailed lighting policy
- As outlined in the Strategic Priorities set by City Council, we are committed to become a green community and reduce energy/power consumption and pollution by exploring and utilizing more environmentally friendly products
- Desire for LED community to recognize the demands on many municipalities and work towards meeting those requirements so all municipalities can benefit from LED technology
- City of Welland recognizes the time for change and responsibility to reduce energy consumption for the residents of the municipality

# Future



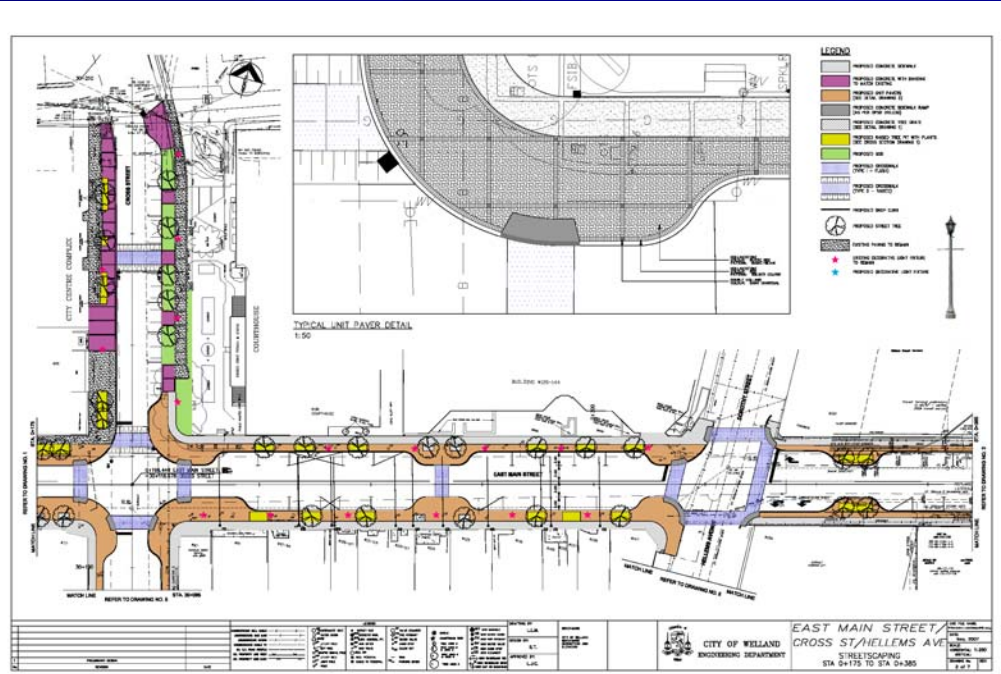
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 Standard subdivision  
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 Municipal changing  
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# Thank You

