



The “10 to 6” Light Waste Reduction Program

Revised 2020-11-19



Home owners turn off their house lights off at night. Why do we not do the same with wasted community lighting?

A. What is a "10 to 6" Light Waste Reduction Program?

A "10 to 6" LWR Program is a program to minimize the light waste, pollution and trespass in a community or area, usually residential, between the hours of 10 p.m. and 6 a.m. to improve health, sleeping and the night environment of residents.

This simple program should

- drastically drop the light waste, trespass, glare and pollution in the city
- provide a darker, healthier sleeping environment for residential areas
- reduce the negative impact of blue-rich LEDs now used in most street lighting
- provide a healthier, more natural night environment for flora and fauna
- darken the night skies to a significant degree for sky watchers and scientists
- make satisfying sky observing from one's home possible again
- drastically reduce the amount of energy used for street lighting (over 66%)
- reduce energy costs, freeing up money for related projects
- reduce maintenance costs and LED replacement costs through non-use

B. Why have a 10 to 6 LWR Program?

Minimizing light levels in an area can have very significant positive effects when one compares it with the various "costs" of lighting communities in the traditional light-wasting manner – lights on all night. (See the film “**Demons in the Light**” on the LEC web site.)

1. Financial Costs

Using the "10 to 6 LWR Program" cuts the lighting energy consumption from a yearly average of approximately 12 hours per day down to 4 hours per day or less, saving at least 8+ hours per day of power. This could save the community or area at least up to $8/12 = 66\%$ of their electrical power. This is an important financial incentive to change. Also great costs are saved on maintenance and replacement of luminaires due to lower hours of luminaire use.

2. Human Costs:

- The health effects and costs can be very high, considering that blue light at night has been scientifically connected with the following health issues: circadian rhythm modification;
1. breast, prostate and colorectal cancers; sleep-



The “10 to 6” Light Waste Reduction Program

deprivation syndrome, Alzheimer's disease, obesity, diabetes, etc.. These costs are very high in human terms considering the effects these maladies have on the people who have them, their families, friends, work, etc.. Doctors have indicated that humans **do need** 8 hours of sleep per night in order to be fully functional the following day. Unfortunately, most people do not get that and their numbers and problems are rapidly increasing according to recent statistics.

3. Medical Health Costs

The amount of health care money spent dealing with all the various diseases and maladies listed above is horrendous to say the least. Health costs are high and continue to climb almost daily. Preventing these serious problems must be paramount when choosing and using community lighting.

4. Environmental Costs

It is not easy to think that simple light has an environmental cost associated with it, but electrical energy has to come from somewhere. Often, it is the burning of some fuel, resulting in the production of various gases detrimental to community health, not only human but flora and fauna. Loss of the night is detrimental to flora and fauna dependent upon its dark environment. Also, loss of habitat, pollution of the sky and waters, acid rains, etc. all add to these costs. Carbon footprints, green-house gases and climate changes are also increased as well as pollution. Just because some power sources are ‘green’ or more efficient does not mean energy should be wasted or misused!

5. Dark Skies & Astronomy

Clear, dark night skies filled with stars are a sheer enjoyment to many people as well as



Even animals must sleep to regain their energy. However, the conditions must also be conducive.

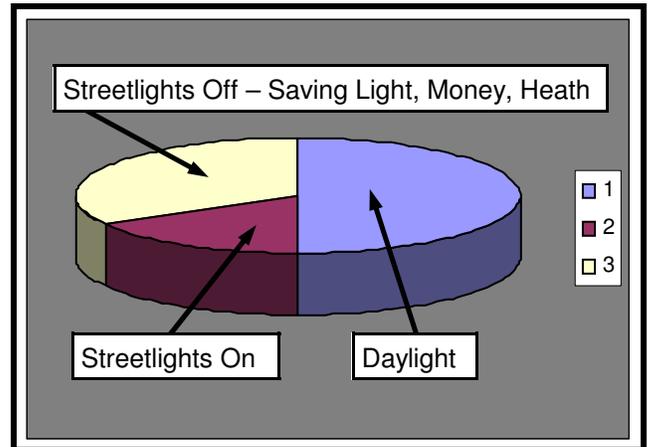
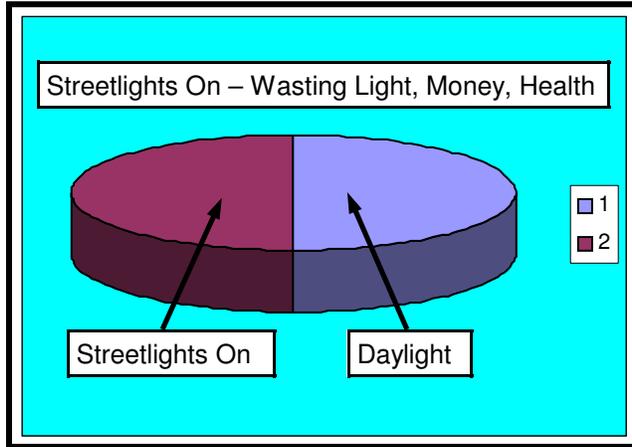
star gazers and astronomers, amateur and professional alike. Also protecting our heritage, this program offers a chance to better see and enjoy the stars our ancestors saw without the usual light waste we currently suffer. It is indeed time for a change and reclamation of our heritage.

6. Legal Considerations:

Light is not a right! Many people assume that municipalities are required to provide streetlights by law but not in Canada. Control over lights depends on municipal policies and councils who decide what, when, where, why and how streetlighting or other lighting is to be provided or not. Municipalities are not responsible for situations that may occur due to low or no lighting. However, since municipalities are responsible for the health and well-being of their citizens and environment, it is imperative in so many ways that lighting be fully considered, appropriately chosen and tightly controlled.



Streetlight Operations – Regular Community vs 10 to 6 LWRP Community



C. The 10 to 6 LightWaste Reduction Program:

1. The Current Lighting Situation

Since most people are trying to sleep after 10 p.m., streetlights continue to be a source of aggravation and are detrimental to sleep.

Unshielded or badly shielded streetlights, especially those that have a colour temperature of 3000 Kelvin and above, are problematic. Blue light-rich LEDs prevent the creation of melatonin in the body, leading to serious, negative and some times fatal health effects for humans and fauna.

In most communities, the lighting situation, over a period of a year, sees streetlights that are fully lit on average, 12 hours per day. There are no savings in lighting, power or electricity costs. The lights are either on at maximum or off completely. This is a tremendous waste as, later in the evening, there is virtually no traffic or pedestrians out on the streets. Also, any traffic is using their headlights which they must do by law.

2. The 10 to 6 LWRP Situation

The yellow area in the graph above shows

the possible savings (>66%) in lighting, electrical power and finances during the course of one year in a 10 to 6 LWRP. Before and after the 10 to 6 hours lighting savings may still be had by reducing lighting levels to ~30% (or lower) thus contributing to greater savings while still providing safety. Lighting levels are currently set far too high!

Before 10 p.m. and after 6 a.m., the streetlights may be shut off completely, kept at a very low level or returned to “regular” levels whatever that may be. There are a wide variety of combinations possible.

The important point is that between 10 p.m. and 6 a.m. streetlights are turned off, especially in residential areas. In other areas, such as industrial, they may be reduced to 30% or less during the whole night. The right combinations must be calculated to meet 10 to 6 LWRP standards (no light) while maximizing safety and savings. Sensors may be used to control streetlights as needed by traffic or pedestrians, also alerting homeowners to ‘intruders’ in the area. Remember, human vision adapts quickly to darkness but is dramatically reduced by dangerous glare from streetlights and vehicles.



Preferred LEC-Compliant luminaires provide complete control over the light being emitted and have a BUG rating of B0-U0-G0, eliminating direct light trespass and glare with full cut-off shielding as well as an efficient LED light source which is not blue-rich and unhealthy. Under computer and sensor control, they are an excellent choice for Light-Efficient Communities.

Light of the right intensity and colour is provided only where and when it is desired or needed.

At 10 p.m. non-residential lights may also dim for a few minutes and then go to black or, they may be lowered to 10% and stay on all night at that or some other level.

At 6 a.m., if needed, the lights resume at preferred defined levels as people set out for work and school, refreshed after another night of comfortably resting and sleeping.

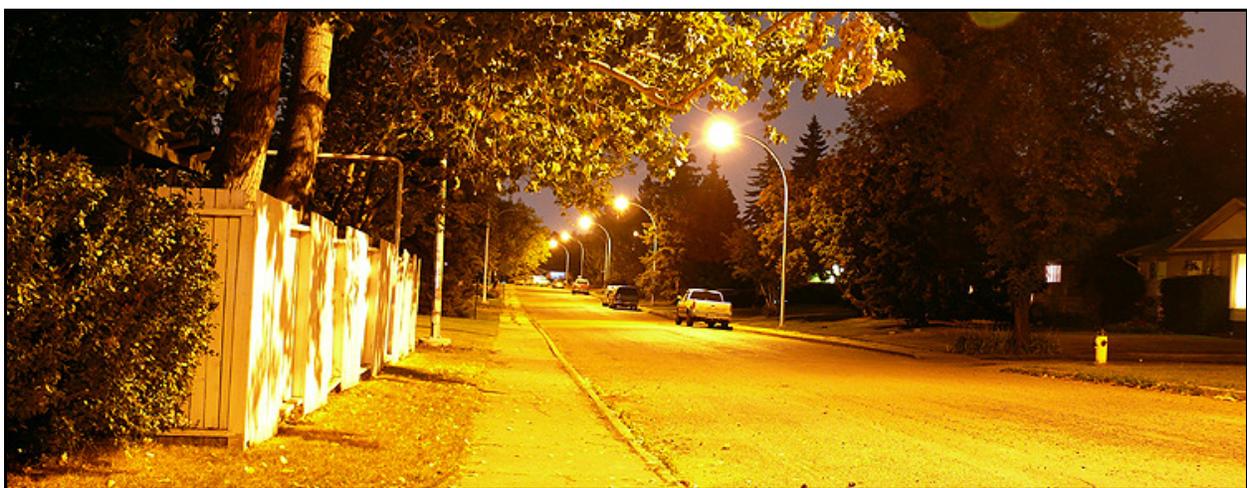
D. How does the 10 to 6 LWRP Work?

A small box on the luminaire allows for computer and sensor controls over the light produced. Sensors may turn the light on or off as needed for passing vehicles or people.

Luminaires that use LED light sources can be controlled from a central computer. The computer can increase and decrease the brightness and levels at specified times. It can also turn the light completely off. The whole system can be automated.

The lighting industry is finally catching up with new technologies and prices are falling as newer and cheaper technologies are introduced. The 10 to 6 LWRP offers communities many options in their lighting, in time for the changes that are rapidly occurring in our society. Now is the time for change and improvements!

(See the web site for related important information and hand-outs, etc..)



21:37 p.m. A city residential street. Note the complete absence of pedestrians and vehicular traffic. Typical of lighting in residential areas, the brilliant, glaring luminaires line the street, casting light onto the streets, the yards and, undesirably, into the bedrooms of residents. With modern policies and technologies, we can now minimize this waste while improving health and environmental concerns.