



THE CITY OF CALGARY

**LAND USE & MOBILITY
CALGARY ROADS (#8030)**

2002 January 23

Robert Foster
Legislative Director
Citizens Campaign for the Environment
170 Washington Avenue
Albany, NY 12210

sent by FAX 518-434-8172

Dear Mr. Foster:

**RE: City of Calgary SMART LIGHTING Project
Streetlight Retrofit Project – Lower Wattages, Flat Lens**

The City of Calgary owns and operates its own roadway lighting system. This system consists of some 70,806 roadway luminaires, consuming approximately 99,350 MWh of electricity annually. The Province of Alberta commenced deregulation of the electrical utilities in January 2001. In early 2001, we experienced a spike in the price of electricity, where the cost per kWh for electricity doubled. This had a significant impact on our electricity bill for the streetlighting system.

At the same time, The City had been looking for efficiencies in the streetlight system. A study was undertaken to determine whether our roadways were appropriately illuminated. It was discovered through an analysis of the existing spacing and layout of the light poles and wattage of the luminaires, that indeed there was excessive illumination of the roadways and that lower wattage fixtures could be used and still achieve the levels of illumination recommended by roadway lighting industry practices outlined in IES RP-8. The principle driver of the retrofit project was the energy savings and cost reduction in electricity. Secondary drivers were environmental benefits including reduction in greenhouse gas emissions resulting from a decrease in electricity demand by our streetlight system.

In reviewing the best practices for roadway lighting, it was determined that the existing cobrahead style luminaires with dropped lens would be retrofit with a full cut-off flat lens fixture, which would have the added benefit of reduced light glare, light trespass and urban sky glow. During our investigation, a number of factors were considered and these became the governing guidelines for our proposed streetlight retrofit project. These guidelines are as follows:

1. Retrofit only streetlights on low volume, low speed roadways in residential subdivisions. The project includes only residential local and collector type roadways and affects approximately 40,000 luminaires

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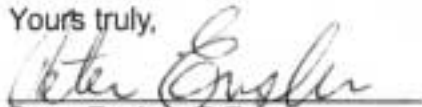
2. Retrofit only streetlights where the existing spacing is such that the lower wattage fixture will still meet minimum IES RP-8 levels of illumination. No additional light poles are to be added.
3. Where lights are spaced too far apart to retrofit to lower wattage, these lights would not be retrofit to lower wattage. When the light eventually fails, these lights would be replaced with flat lens fixtures of the same wattage. It is important to understand this distinction that the streetlights are not being retrofit based on environmental benefits, but only where cost savings demonstrate this can be done and a reasonable payback can be proven, which is the principal driver.
4. The cost of the retrofit is estimated to be \$7.2M. The retrofit project was approved by City Council to proceed on the basis that the energy savings would be used to pay for the cost of the retrofit luminaires. At the same time, \$3M in grant funding was approved from ICAP (Infrastructure Canada Alberta Program), where all three levels of government, municipal, provincial and federal, cost shared 1/3 each towards this project.
5. Safety for all road users including the motoring public and pedestrians is considered paramount. Lighting to IES recommendations takes this into account. We have found that while retrofitting to lower wattage fixtures will cause the roadway to appear dimmer, the combination of going to a flat lens reduces glare and will actually improve roadway visibility.
6. Pilot projects were conducted in existing areas to test the retrofit luminaires. Initial Public reaction has been mixed, however due to the compelling energy and cost savings and benefits to the environment and health, the public is showing great interest and support for this retrofit project.

Our City wide retrofit project will be phased in over a period of 4 – 5 years. We are about to award the contract to a company to undertake the retrofit work in one quadrant of the City, which will involve approximately 12,000 luminaires. This SMART LIGHTING retrofit program has gained national attention through the media, but we appreciate that not all jurisdictions are able to realize the same benefits that our project can achieve due to the existing design and layout of their streetlight systems. All factors need to be carefully reviewed to determine the feasibility of doing a retrofit. All the costs must be counted so that all parties are fully aware of the impacts, both positive and negative, including fiscal, environmental, safety, health and social costs. In addition, we believe that undertaking a proper feasibility study in the first place would be a better approach rather than mandating or introducing a lighting bill requiring the use of cutoff fixtures in existing systems, and then finding out that it is not practical in terms of cost. The City of Calgary has also revised its design guidelines to require that all new installations be constructed to lower wattage and flat lens. Addressing these issues at the outset for new construction eliminates the expense and possible problems that can be encountered on a retrofit project.

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Should you have any questions or require clarification on the above, please contact the undersigned at 403-268-5019 or Barry Poon, Coordinator, Streetlighting & Subdivisions at 403-268-3770.

Yours truly,



Peter Ensler, P.Eng.
Manager, Construction & Materials
Calgary Roads (#8030)

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