



CITE - Calgary  
Advances in Energy Efficient  
Street Lighting

Don McLean

DMD & Associates Ltd.

[www.dmdeng.com](http://www.dmdeng.com)

# Today's Presentation

Overview of Transportation Association of Canada – Lighting Reduction and Energy Efficiency Guide

Review some key elements and parts of the Guide

# TAC Light Level Efficiency and Power Reduction Guide - Background

- Technology and products have been developed quicker than standards and application. Need for National Publication.
- Need for a sound basis of science, research and logic.
- Defines a complete process to assess and deploy energy efficient street lighting.
- Guide will be used by cities, lighting designers and suppliers.

# TAC Light Level Efficiency and Power Reduction Guide – Outline (1 of 2)

## I Introduction

## 2 Design Considerations

- 2.1 Where to Light
- 2.2 Half Code Lighting
- 2.3 Alternatives to Lighting
- 2.4 Spectral Effects (Mesopic Factors)
- 2.5 Lighting and Controls
- 2.6 Specific Lighting Applications

## 3 Lighting Technologies

- 3.1 Adaptive Lighting Controls
- 3.2 Motion Detection Controls
- 3.3 Energy Efficient Light Sources
- 3.4 Alternate Power Sources

## 4 Key Product Considerations and Testing

- 4.1 Performance
- 4.2 Quality
- 4.3 Durability
- 4.4 Functionality
- 4.5 Warranty
- 4.6 Reference Standards

# TAC Light Level Efficiency and Power Reduction Guide – Outline (2 of 2)

## 5 Assessing and Evaluating Benefits

- 5.1 Monetary Evaluation
- 5.2 Environmental Evaluation

## 6 Lighting Retrofit and Deployment Process

- 6.1 Feasibility Study and Cost Benefit
- 6.2 Inventory Assessment of Existing Lighting
- 6.3 Determine Technologies and Develop Performance Specifications
- 6.4 Product Procurement
- 6.5 Installation
- 6.6 Commissioning and Testing
- 6.7 Performance Monitoring and Review
- 6.8 Public Education and Communications Program

# Retrofit and Deployment

- **Inventory and Design** – Define what exists poles, spacing, road types, widths, sidewalks, lighting criteria, etc. Use city GIS system. Many roads are over lit to achieve the required uniformity. LED's improve the uniformity. Proper analysis and assessment of optical systems (by lighting calcs) is how you achieve 50%-60% energy savings. Lighting calcs to define luminaire distribution and wattage and to make sure required lighting levels are achieved.
- **ROI** – Define and review ROI and benefit. Define budget and funding.
- **Specifications** – Develop
- **Procurement** – Issue specs and review submittals to define bet value. Review of photometric's, products, test results and data required.
- **Test and Commission** – Required for adaptive controls
- **Monitor and Review** – During construction
- **Public and Communications Program** – Pre and post Construction. Recommend public education and information program as per the City of Calgary (EnviroSmart) Program.

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# Project Steering Committee

The report was developed under supervision of a project steering committee of volunteer members:

- Gord Cebryk (Chair)
- Martin Aitkenhead
- Canace Bain
- Richard Chow
- Shawn Dillon
- Steven Drew
- Yves Gaudreault
- Taso Koutroulakis
- Quang Thin
- William Ross Quackenbush
- Simon Tam
- Phillippe Vézina
- Sandra Majkic



# Consultant Team

## DMD & Associates Ltd. (Prime Consultant)

- Don McLean, Project Manager and Lead Author
- Daniel Wong, PEng, PE, Quality Control and Review
- Donato Speidel, Review



## Parsons Brinckerhoff

- Paul Lutkevich, PE



## Virginia Tech Transportation Institute

- Dr. Ronald Gibbons



# Abstract

The purpose of this guide is to:

- review options and provide guidelines for light level reductions and energy efficiency
- provide information about how to apply energy efficient roadway lighting, while reducing power consumption and cost
- provide a “tool box” of information that aims to allow city administrators, designers, consultants, and suppliers to assess, evaluate, select, and deploy energy efficient roadway lighting.

# Abstract Continued

- Information was gathered from research and studies conducted all over the world
- From these findings it was concluded that energy-saving lighting technologies and controls have significant energy savings benefits
- Due to lack of information regarding energy-saving lighting technologies, many jurisdictions have resisted adopting them, as there is a lack of understanding about their risks and benefits
- This guide aims to provide this previously lacking information