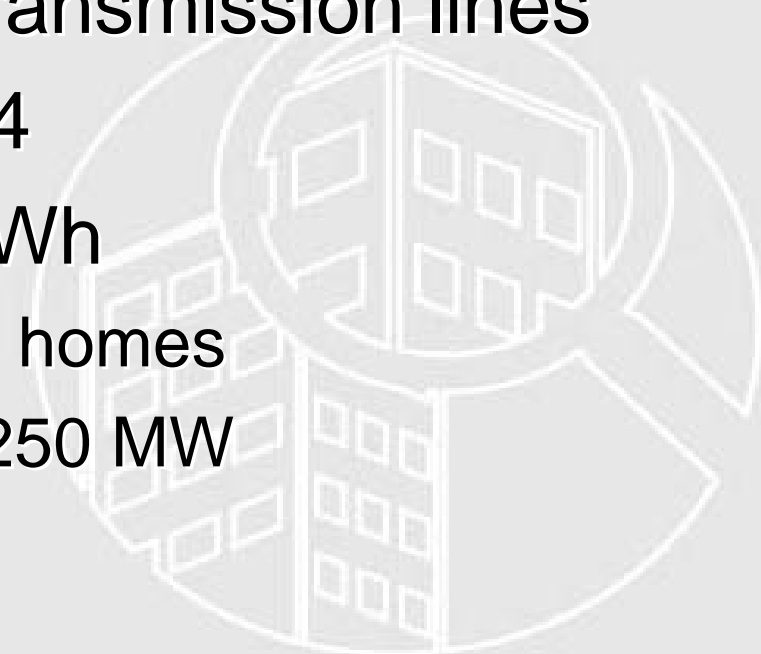


Power Smart Roadway Lighting



BC Hydro - statistics

- 1.6 Million customers - serving 94% of BC
- Generating 50,000 GWh annually
- 73,000 KM of distribution and transmission lines
- Net income \$402 Million in 2004
- Power Smart savings - 3600 GWh
 - ◆ enough energy to power 360,000 homes
 - ◆ equivalent to the output of 1.5 - 250 MW natural gas generating stations



Roadway Lighting in BC

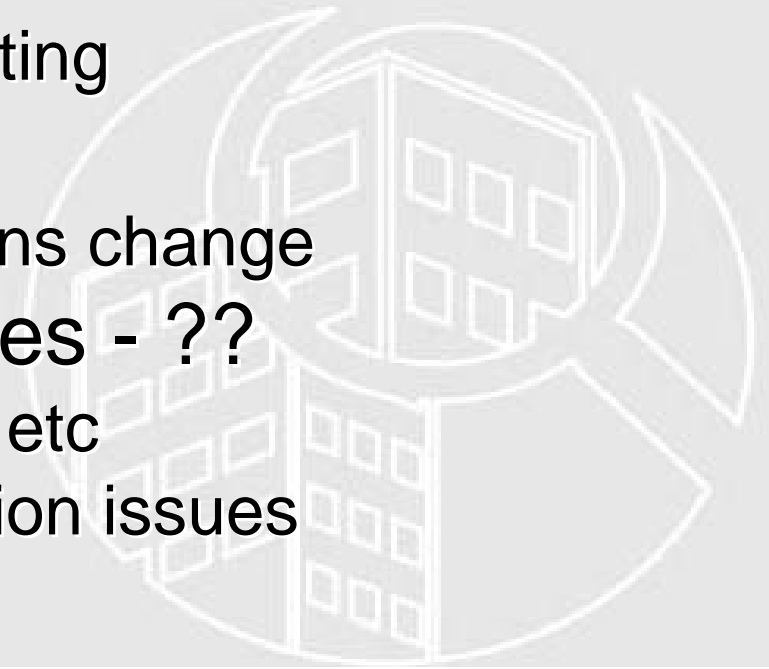
- 600 Municipal and Government Customers
- approximately 300,000 roadway lights in BC
- potential energy savings from EE roadway lighting is between 45 to 60 GWh



Roadway Lighting Pilots

- testing new technologies

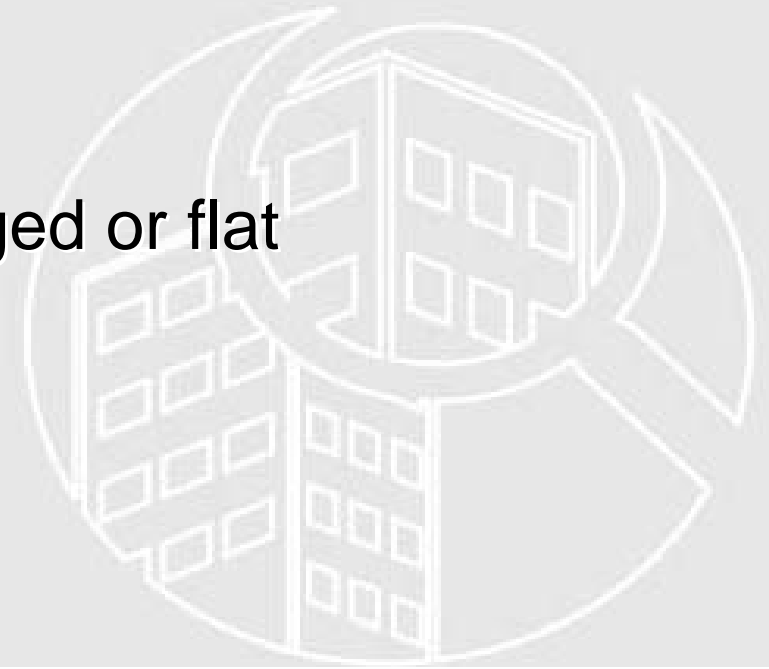
- Improved lighting optics - 5 to 20%
 - flat glass lens to reduce glare, energy but not light levels
- Electronic ballasts - 10 to 20%
 - for High Pressure Sodium street lighting
- Lighting control - 20 to 40%
 - to reduce light levels as traffic patterns change
- New more efficient technologies - ??
 - other light sources - Induction, LED, etc
 - reduced lighting levels - scotopic vision issues



Power Smart Technologies

Lighting Optics

- Improvements to optics system design
- Lamp placement
- Reflector Design
- Lens design - dropped, sagged or flat
- Lighting maintenance



Power Smart Technologies

Electronic Ballasts

- Bench tests indicate there is a potential **20% efficacy** improvement over the standard magnetic ballasts
- BC Hydro and the City of Vancouver have a test installation and demonstration project
 - power input and illuminance levels - initial and maintained
 - installation issues with retrofit of existing luminaires
 - lamp and ballast performance and durability

City of Vancouver Electronic Ballast Pilot

■ Test Installation of Electronic Ballasts

- 17 - 250Watt HPS on Major Street
- 10 - 150 Watt HPS on Collectors
- 09 - 150 Watt HPS on Residential

Total of 36 electronic ballasts installed
- 17 failures to date



Roadway LED Lighting Pilots

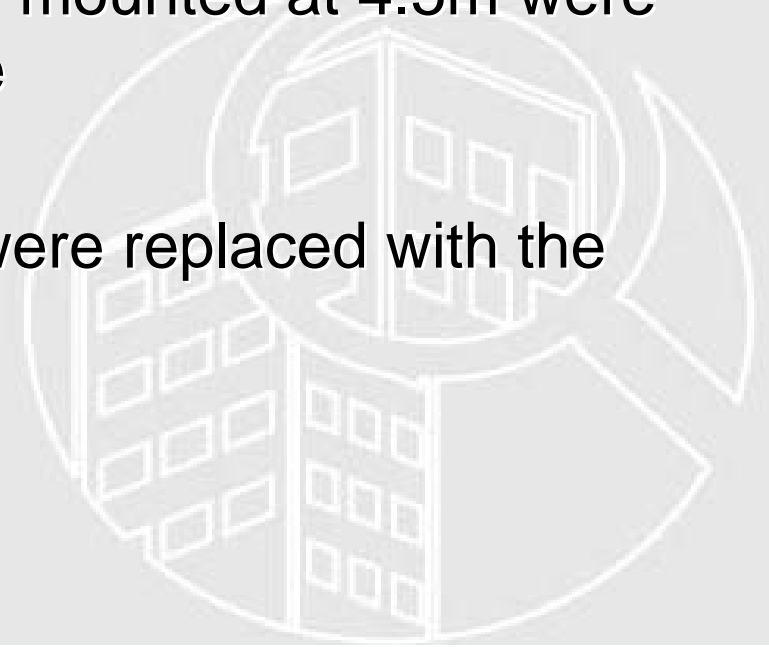
LED Heads for Street and Roadway Lighting

Richmond:

3 -175W MH pathway luminaires, mounted at 4.5m were replaced with 42W LED luminaire

Surrey:

3 -100W HPS mounted at 7.5m were replaced with the 42W LED luminaire



42Watt LED Replacing 175W MH



175W MH - 4.5lux ave.

42W LED - 4.1 lux ave.

As the Richmond site is a small path, the visual quality is seen to be acceptable



42Watt LED Replacing 100W HPS

100W HPS - 5.4lux

42W LED - 1.3 lux

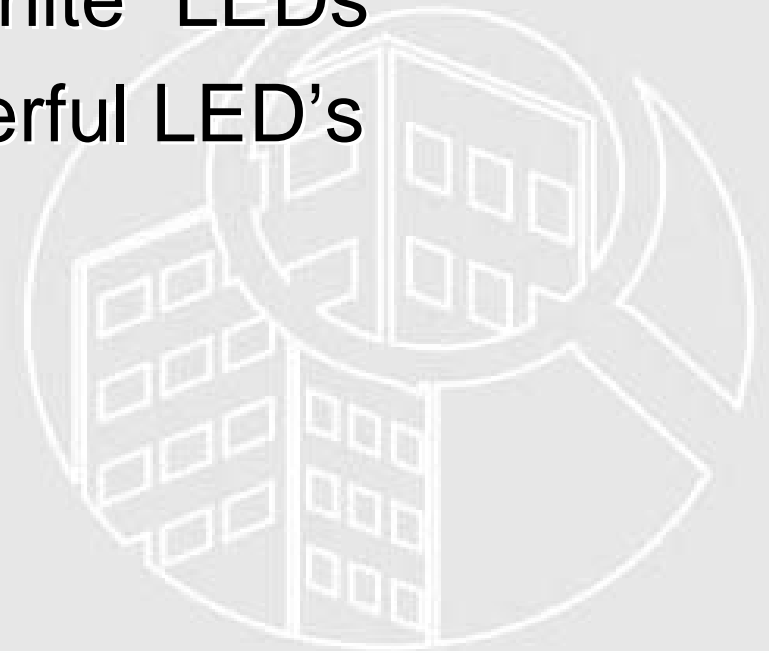
light levels are not sufficient



Roadway LED Lighting Technology

LED's not ready for general roadway lighting

- continued improvements to LED efficiency
- continued refinement of “white” LEDs
- development of more powerful LED's



Power Smart Technology Pilot

Lighting Control

- HPS light sources can be dimmed to 50% Power.
- Potential to reduce light levels on many roadways as traffic patterns change
- BCH and City of Prince George pilot project will test the technology and confirm operational and energy savings.

www.city.pg.bc.ca/pages/media2005/2005_01_06.html



Power Smart Roadway Lighting Program

- offer incentives for more efficient optical systems
- offer incentives for adaptive lighting control
 - based on percent input wattage reduction.
- support development and testing of electronic ballasts and LED sources for roadway lighting