

NO: **R268**

COUNCIL DATE: **December 19, 2016**

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## REGULAR COUNCIL

TO: **Mayor & Council** DATE: **December 15, 2016**  
FROM: **General Manager, Engineering** FILE: **5420-01**  
SUBJECT: **Roadway Lighting Upgrade Program to LED (Light Emitting Diode) Technology – Colour Temperature Review of LED Fixtures**

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## RECOMMENDATIONS

The Engineering Department recommends that Council:

1. Endorse the use of 3000K colour temperature LED roadway lighting fixtures on local residential roads; and
2. Endorse the use of 4000K colour temperature LED roadway lighting fixtures on arterial and collector roads (as defined by Surrey Road Classification Map R-91), non-residential local roads and all roads within the City Centre.

## INTENT

The purpose of this report is to:

- Provide information about colour of light emitted by roadway lighting fixtures and the American Medical Association (AMA) recommendations; and
- Obtain direction from Council on the colour temperature to be used for new installations of LED roadway lighting fixtures.

## BACKGROUND

At its Regular meeting on February 1, 2016, Council adopted the recommendations of Corporate Report No. R018;2016 (attached as Appendix “I”), which provided information on LED lighting, including reduced energy consumption, longer life, reduced maintenance costs, improved light quality (and hence safety), and a 5 year strategy to convert all 28,000 streetlights in Surrey to LED.

At its Regular meeting on May 30, 2016, Council adopted the recommendations of Corporate Report R121;2016 (attached as Appendix “II”), which provided additional information on environmental benefits and considerations with LED lighting along with recommendations on LED fixture procurement and installation for City Centre and re-lamp Zone B.

Subsequently, in June of 2016, the American Medical Association (AMA) published a report that raised concerns with the blue-rich light of LED streetlighting. They have recommended the use of 3000 kelvin (K) streetlights to avoid excessive exposure to blue-rich light that they believe may cause bodily responses such as suppression of the hormone melatonin, as well as disruption of circadian rhythms, which can impact sleep.

## **Colour Temperature of Light**

The colour temperature of light is a perceived characteristic of visible light expressed in kelvins. Generally speaking, colour temperatures of 5000K or higher (e.g., sunny day measures 5500K and an overcast day measures 6500K) are classified as cool colours (blueish light), and colour temperatures below 5000K (e.g., a typical household incandescent light bulb measures 2400K) are classified as warm colours (yellowish/red light).

## **High Pressure Sodium Roadway Lighting Fixtures**

The City has a current inventory of approximately 28,000 high pressure sodium (HPS) roadway lighting fixtures, which emit a warm, yellow light that measures a colour temperature of approximately 2200K.

Although the use of HPS lighting fixtures is widespread throughout the world and meets currently established North American engineering performance criteria, the yellow light emitted by HPS lighting fixtures has limited colour rendition, which limits colour visibility at night.

## **LED Roadway Lighting Fixtures**

Compared to HPS roadway lighting, LED roadway lighting offers superior lighting colour rendition, thereby making it easier for road users to see illuminated roadway features, including pedestrians and signs. Most LED installations completed to date in North America have used LED lighting fixtures with colour temperatures of 4000K or 5000K.

More recently, 3000K colour temperature LED lighting fixtures have become available. Replacing the City's existing HPS lighting fixtures with LED lighting fixtures will change the colour characteristic of the City's lighting infrastructure from a warm yellow colour to a cooler white light, regardless of which LED colour temperature is specified.

## **DISCUSSION**

In response to the AMA concerns and recommendations regarding LED colour temperature, the Engineering Department has completed:

1. In-field roadway lighting installations of 3000K and 4000K LED roadway lighting fixtures for staff/public assessment;
2. Consultation with roadway lighting professionals, literature reviews and discussions with other jurisdictions; and
3. A modified LED Roadway Lighting Upgrade Plan with due consideration to both the AMA recommendations and good engineering lighting practice.

## **In-field Reviews of 3000K and 4000K LED Roadway Lighting Fixtures**

Since early 2015, the Engineering Department has completed several LED roadway lighting projects in high profile areas, including 72 Avenue between King George Boulevard and 138 Street. This installation in the Newton Town Centre utilized the 4000K colour temperature and had very positive feedback from commercial business owners and patrons. More recently, several local roads in the Fraser Heights area were retrofitted with both 3000K and 4000K LED lighting fixtures for comparison purposes. The LED roadway lights in Fraser Heights were assessed based on:

- Engineering Criteria (i.e., meeting current design criteria, retrofit compatibility, long term performance, colour rendition and depth of field perception);
- Compatibility Aspects (i.e., transition/harmony with B.C. Hydro leased lights and neighbourhood streetscapes); and
- Cost Aspects (i.e., product cost, installation cost, and electrical operating cost).

3000K and 4000K LED lighting fixtures meet established engineering criteria, and are both able to accommodate unique compatibility aspects. 3000K LED fixtures have a slightly higher (approximately 5%) electrical operating cost than 4000K LED fixtures, but there is no difference in product or installation costs.

Consistent with our review of the literature and feedback from other jurisdictions, staff observed in the field that the 4000K streetlights emitted a slightly brighter light with greater illumination on the roadway and better colour rendition than the 3000K streetlights.

### **Best Practices Review**

Consultation with roadway lighting professionals, the public and other jurisdictions along with a review of relevant literature revealed the following considerations regarding 3000K versus 4000K colour temperature LED lighting fixtures:

- The degree of exposure to blue-rich light is far more relevant than the colour temperature of the LED lighting fixture. Well-engineered designs (regardless of LED lighting colour temperature) that meet established design criteria (i.e., designs that limit glare, intrusion into private property, etc.) are most important in order to minimize blue-rich light exposure.
- The degree of control, inherent to LED roadway lighting fixtures (i.e., intensity, direction and pattern), greatly contributes to minimizing the degree of blue-rich light exposure.
- LED roadway lighting fixtures, regardless of colour temperature (3000K to 5000K) drastically improve colour rendition and depth of field perception when compared to existing HPS lighting fixtures, and will be a considerable roadway safety enhancement. A 4000K colour temperature LED fixture marginally outperforms a 3000K colour temperature LED fixture in terms of colour rendition and depth of field perception.
- Most LED installations completed to date in North America have used LED lighting fixtures with colour temperatures of 4000K or 5000K. With the recent availability of 3000K LED fixtures, several jurisdictions in British Columbia are considering the use of 3000K LED fixtures on lower volume, residential roadways, including Victoria, Kelowna and Richmond.
- In addition to the Newton pilot on 72 Avenue with 4000K LED streetlights, which received very positive feedback from the business community and their customers, we also undertook a survey of 60 residents on the 4000K streetlights installed on 108 Avenue. 96 percent were in favour or neutral regarding the new lights, with only 4 percent against them.

Based on staff observations, literature review, public feedback and input from lighting experts, staff have concluded that roadways with higher pedestrian and vehicle volumes (City Centre and arterial, collector and non-residential local roads) should have 4000K colour temperature LED fixtures. On lower volume local residential roads, the slightly warmer 3000K colour temperature LED fixtures would better integrate with low intensity household lighting.

## SUSTAINABILITY CONSIDERATIONS

The adoption of LED roadway lighting supports the objectives of the City's Sustainability Charter. In particular, LED roadway lighting relates to the Sustainability Charter themes of Public Safety and Built Environment and Neighbourhoods. Specifically, this project supports the following Desired Outcomes:

- Community Safety and Emergency Services DO1: Residents are safe and have a strong sense of security in all neighbourhoods and throughout the City; and
- Neighbourhoods and Urban Design DO4: Surrey's neighbourhoods are safe, accessible, well-connected, walkable and bike friendly.

## CONCLUSION

Well-engineered designs (regardless of LED lighting colour temperature) that meet established design criteria are expected to minimize blue-rich light exposure and address the concerns raised in the AMA report.

Based on a comprehensive review that involved expert input, public feedback, in-field assessment, literature review and consultation with other jurisdictions regarding 3000K versus 4000K colour temperature streetlights, staff recommend the following adjustments to the LED Roadway Lighting Upgrade Program:

- On lower volume local residential roads, utilize the slightly warmer 3000K colour temperature LED fixtures to better integrate with low intensity household lighting; and
- On arterial, collector and non-residential local roads and all roads in City Centre, utilize the 4000K colour temperature LED fixtures to maximize colour rendition and visibility for these higher pedestrian and vehicle volume routes.

Following installation of the first year's LED lights, staff will reassess the colour temperature of the LED's based on any new studies and further input from the public. If any change needs to be considered, staff will report back to Council for direction.

Fraser Smith, P. Eng., MBA  
General Manager, Engineering

JB/RKR/brb/cc

Appendix "I" - Corporate Report No. R018; 2016  
Appendix "II" - Corporate Report No. R121; 2016

NO: R018

COUNCIL DATE: February 1, 2016

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**REGULAR COUNCIL**

**TO: Mayor & Council** **DATE: January 28, 2016**

**FROM: General Manager, Engineering** **FILE: 5420-01**

**SUBJECT: Roadway Lighting Upgrade Program to LED (Light Emitting Diode) Technology**

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**RECOMMENDATION**

The Engineering Department recommends that Council:

1. Endorse a five year implementation strategy for the replacement of 28,000 existing roadway lighting fixtures with LED roadway lighting technology, starting in City Centre; and
2. Endorse the Engineering Department bringing forward a separate Corporate Report for the procurement of product and labour for the LED Roadway Lighting Upgrade program.

**INTENT**

The purpose of this report is to provide background information about the operational benefits of LED roadway lighting, and provide details about upgrading the City's roadway lighting infrastructure to LED lighting, starting in City Centre.

**BACKGROUND**

Since the early 1970's, the City has installed high pressure sodium (HPS) roadway lighting fixtures mounted on freestanding steel poles as part of road widening and land development projects. The City currently has an inventory of approximately 28,000 lighting fixtures. LED roadway lighting fixtures have been readily available for the past 10 years. However, the implementation of LED lighting technology has been delayed due to poor light output, questionable reliability, negligible power savings and high purchase costs when compared to HPS lighting fixtures.

Over the past year, the Engineering Department has expended considerable effort to evaluate the latest advancements in LED roadway lighting technology. Recent studies have determined that the latest LED roadway lighting fixtures outperform existing HPS lighting fixtures and can be directly retrofitted on existing freestanding steel poles, without pole modifications.

On March 30, 2015, the Transportation and Infrastructure Committee endorsed an Engineering Department pilot project initiative to proceed with LED lighting in Newton Town Centre. The first project, the installation of 8 LED lights near the Newton Recreation Centre, received very positive feedback from the Newton Town Centre business owners. Based on this feedback, the Engineering Department has just completed the replacement of the existing ornamental roadway lighting fixtures in Newton Town Centre on 72 Avenue between King George Boulevard and 138 Street with LED roadway lighting.

## **DISCUSSION**

The Engineering Department's recent review of LED roadway lighting consisted of evaluating:

- Light quality/control/uniformity;
- Maintenance requirements/life expectancy; and
- Power savings.

### **Light Quality/Control/Uniformity**

Compared to HPS roadway lighting, LED roadway lighting offers superior lighting colour, making it easier for road users to see pedestrians and signs. Control of light concentration and improved lighting uniformity is also achievable with LED's, leading to reduced road user eyestrain and fatigue.

### **Maintenance Requirements/Life Expectancy**

HPS roadway lighting fixtures require re-lamping (bulb replacement) and cleaning every five years. LED fixtures have a life expectancy approaching 20 years and do not require bulb replacements at 5 year intervals, thereby significantly reducing maintenance frequency. In addition, with LED fixtures, cleaning intervals can be increased from 5 year intervals to 10 year intervals. As a result, with LED lighting installed throughout the City, maintenance cost savings of approximately 75% are expected, with maintenance costs reduced by approximately \$300,000 annually.

### **Power Savings**

The replacement of existing HPS roadway lighting with LED roadway lighting throughout the City will result in power consumption cost savings of approximately 30%, with power consumption costs reduced by approximately \$700,000 annually. Thus, upon full replacement of the roadway lighting, there will be a total annual savings of \$1,000,000 per year (savings from maintenance and reduced power consumption).

## **JUSTIFICATION**

Using the B.C. Hydro Power Smart financial evaluation tool provided to municipalities in B.C. (as part of the "LED Street Lights Across B.C." initiative), the change to LED roadway lighting for the entire City has a return on investment (ROI) payback period of between 8 and 10 years. The calculated ROI takes into account the capital cost of the LED lighting fixtures, installation costs, power savings and maintenance savings over a 15 year period, as compared to the alternative "business as usual" model of maintaining existing HPS roadway lighting over the same 15 year period.

As noted within this report, LED roadway lighting outperforms existing HPS lighting in all respects: light quality/control/uniformity, maintenance requirements, life expectancy and power savings. Furthermore, pilot tests have shown that residents and business owners have a very positive opinion of LED lighting.

## **IMPLEMENTATION STRATEGY**

Currently, re-lamping of 1/5 of the City's HPS roadway lighting inventory is completed annually in 5 predefined areas (i.e., Newton, South Surrey, North Surrey, Cloverdale, and Guildford). This area specific mass re-lamping program has ensured that every HPS light (with a typical useful bulb lifespan of 5 years) is changed every 5 years, significantly reducing the City's maintenance costs by reducing the number of "call-outs" to change individual burned out street lights.

To minimize the costs associated with converting HPS lighting to LED lighting, the Engineering Department recommends eliminating the HPS lighting re-lamping program and replacing it with a LED Roadway Lighting Upgrade program, starting in 2016 in the Guildford sector and the City Centre area within the North Surrey zone. The boundaries of these areas are shown in Appendix "I" as Zone B and the City Centre area within Zone A.

While the remainder of Zone A was re-lamped in 2015, the City Centre area was not re-lamped as it was considered an ideal location to initiate the LED Roadway Lighting Upgrade program on the basis of the high percentage of pedestrians in City Centre and the safety benefits of the higher quality of light inherent to LED lighting fixtures.

Immediately following the conversion of the roadway lights in City Centre, we will establish a process for public feedback on the new LED lighting which should provide valuable insight for the remainder of the conversion program.

From 2017 to 2020, the LED replacement would occur in each of the Zones according to the original re-lamping schedule.

In addition to the 28,000 streetlight poles in Surrey, there are 9,000 roadway lights that BC Hydro has installed on their power poles for the City. These are owned and maintained by BC Hydro with the City paying an annual lease rate. BC Hydro is currently reviewing conversion of their roadway lights to LED and we expect that they will initiate conversion in 2017.

On streets that have City streetlight poles on one side of the road and BC Hydro lights on the other side of the road, the City will coordinate conversion of the roadway lights with BC Hydro to ensure that we maintain appropriate and uniform lighting levels.

## **Product Procurement**

The Engineering Department recommends the purchase of product for the LED Roadway Lighting Upgrade program through the Corporate Supply Arrangement (CSA) organized by the Provincial Government as part of the B.C. Hydro "LED Street Lights Across B.C." initiative. This initiative offers rebates of approximately 30% (applied to the LED fixture purchase price) and is offered to all municipal governments in B.C. The initiative has been endorsed by the City's Purchasing Section. A competitive process for purchasing product will not be required, since identical product pricing is offered to all B.C. Hydro customers.

## **FUNDING**

### **City Wide Project**

The estimated cost of a city-wide replacement of roadway lighting fixtures is \$11,000,000. Of the \$11,000,000 estimated cost, approximately \$10,300,000 is dedicated to purchasing product.

The remaining \$700,000 of the \$11,000,000 estimated cost is dedicated to the labour component of replacing 28,000 HPS roadway lighting fixtures with LED fixtures on existing freestanding steel poles.

### **Zone B and City Centre Component**

The estimated cost of replacing approximately 1,100 roadway lighting fixtures in City Centre and 6,000 roadway lighting fixtures in Zone B (product cost and labour) is \$2,600,000 (excluding applicable taxes). The cost for the City Centre roadway lighting replacement is higher than elsewhere in the City as there is a large number of decorative post top style street lights that have a higher cost for replacement. The Engineering Department has funding available within the Traffic Operations budget for the City's portion of this cost.

Details of the product purchase and labour procurement recommendations for both the city-wide project and the Zone B and City Centre component will be submitted for Council's consideration in a separate report.

## **SUSTAINABILITY CONSIDERATIONS**

The adoption of LED roadway lighting will assist in achieving the objectives of the City's Sustainability Charter, more particularly the following action items:

- SC11: Public Safety and Security;
- EC3: Sustainable Infrastructure Maintenance and Replacement;
- EC5: "Green" Infrastructure & Sustainability Grants; and
- EN1: Energy Efficiency.

## **CONCLUSION**

The proposed LED roadway upgrading program would make the City of Surrey one of the first cities in Canada to undertake a full conversion of roadway lighting to LED.

LED roadway lighting offers superior light quality, lower maintenance requirements, increased life expectancy, substantial power savings and favourable public opinion when compared to existing HPS lighting. These characteristics, combined with the rebates presented by B.C. Hydro, offer a ROI payback period estimated to be less than 10 years.

It is expected that the majority of the City's existing inventory of HPS roadway lighting can be changed to LED roadway lighting within the next 5 years by replacing the current HPS lighting re-lamping program with the LED Roadway Lighting Upgrade program. This proposed infrastructure replacement program is consistent with several of the City's key objectives in the Sustainability Charter.

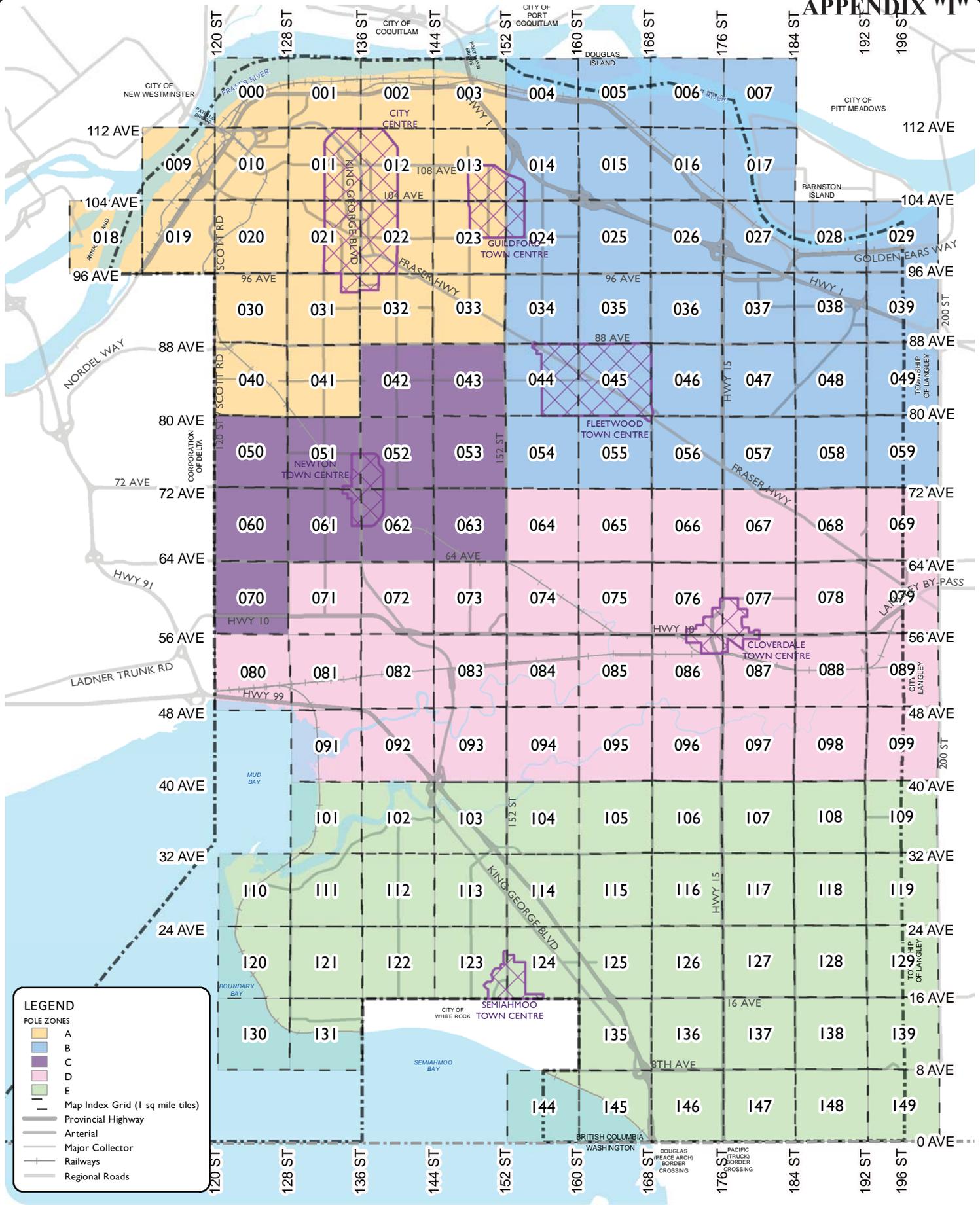
The Engineering Department recommends that Council endorse the proposed LED roadway lighting upgrade program. A separate report will be submitted to Council regarding product and labour procurement subject to endorsement of the proposed LED roadway lighting upgrade program.

Fraser Smith, P.Eng., MBA  
General Manager, Engineering

JB/SP/clr

Appendix "I" – Re-lamping Zones

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**LEGEND**

**POLE ZONES**

- A
- B
- C
- D
- E

Map Index Grid (1 sq mile tiles)

Provincial Highway

Arterial

Major Collector

Railways

Regional Roads



The data provided is compiled from various sources and IS NOT warranted as to its accuracy or sufficiency by the City of Surrey. This information is provided for information and convenience purposes only. Lot sizes, legal descriptions and encumbrances must be confirmed at the Land Title Office. Source: G:\MAPPING\GIS\Maps\Recurring\trnPoles\_GIS\trnPoles\_RelampZones\_A.mxd Cartographer: em9 © City of Surrey Date: 21-Jan-2016

NO: R121

COUNCIL DATE: May 30, 2016

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**REGULAR COUNCIL**

**TO: Mayor & Council**

**DATE: May 26, 2016**

**FROM: General Manager, Engineering**

**FILE: 5420-01**

**SUBJECT: 2016 LED Roadway Lighting Upgrade Program**

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**RECOMMENDATION**

The Engineering Department recommends that Council:

1. Receive this report for information regarding the significant benefits and environmental assessment of LED roadway lighting;
2. Authorize the product purchase of approximately 6,189 Cobra head style LED roadway lighting fixtures from the Provincial Corporate Supply Arrangement (CSA) to replace existing street light fixtures within City Centre and re-lamp Zone B (see Appendix "I");
  - That LED Roadway Lighting Ltd. be engaged with an upset limit in the amount of \$2,300,000.00, including GST/PST and contingency, for the supply of 5,001 LED fixtures; and
  - That EECOL Electric be engaged with an upset limit in the amount of \$760,000.00, including GST/PST and contingency, for the supply of 1,188 LED fixtures for intersections and other specific locations requiring brighter lighting levels;
3. That LUMCA Inc. be engaged with an upset limit in the amount of \$670,000.00, including GST/PST and contingency, for the supply of 401 City Centre decorative LED fixtures; and
4. That the City's electrical maintenance contractor, Cobra Electric Ltd., be engaged for installation of the LED roadway lighting products in lieu of the contracted re-lamp program at an estimated cost of \$320,000.00, including GST and contingency.

**INTENT**

The purpose of this report is to request authorization of the LED roadway lighting implementation strategy for 2016 and to provide information in response to recent concerns about the environmental impacts of LED roadway lighting.

## **BACKGROUND**

On February 1, 2016, Council approved Corporate Report No. R018;2016, *Roadway Lighting Upgrade Program to LED Technology*, which recommended a five year implementation strategy for LED roadway lighting and submission of a Corporate Report for procurement of the product and labour. This report details the procurement along with product and environmental information.

### **LED Roadway Lighting Products**

The lighting fixtures to be installed in the City as part of the 2016 LED Roadway Lighting Program have been pre-qualified as part of the Province's CSA for the supply and delivery of LED Street Light Luminaires. The CSA is a collaboration of the Province and B.C. Hydro Power Smart to create a centralized procurement offering to assist public entities across the Province in converting to LED street lights.

The LED lighting products offered as part of the CSA process have undergone extensive evaluation related to compliance with applicable standards, including a product's ability to meet:

- Illumination Engineering Society of North America (IESNA) design/testing criteria, including backlight, uplight and glare ratings;
- American National Standards Institute (ANSI) and Institute of Electrical and Electronics Engineers (IEEE) surge voltage and vibration specifications;
- Federal Communications Commission (FCC) 47 CFR part 15 radio emission rules;
- CSA, ULC or ETLc certification;
- Restriction of Hazardous Substances (RoHS) Directive compliance; and
- DesignLights Consortium Qualified Products List qualifications.

City Centre decorative streetlights are specified as LUMCA concept series decorative fixtures. These fixtures are required from the Manufacturer.

## **DISCUSSION**

### **Environmental Benefits / Assessment**

Staff have undertaken considerable research in order to assess the environmental benefits and drawbacks of LED street lights related to wildlife, human sleep patterns, recycling, radio signal waves, and light output coverage/uniformity/property intrusion compared to existing high pressure sodium (HPS) lighting technology.

Staff have also hired a consultant to undertake a literature review of scientific papers investigating the effects of artificial light on wildlife, specifically addressing wildlife in the Pacific Northwest. The consultant will also consider our local context to recommend potential mitigation measures/strategies if issues with respect to wildlife are identified. Submission of their report is expected in early June.

To help address some concerns regarding wildlife and human sleep pattern impacts, the Engineering Department has specified a relatively warm colour temperature output of approximately 4,000 Kelvin (the same colour of light emitted by the moon on a clear night). This colour temperature avoids the blue-rich light that potentially disrupts wildlife and human sleeping/eating/exercising patterns. LED fixtures are also expected to be much less attractive to nocturnal insects compared to HPS lighting technology due to the lack of ultraviolet and infrared light spectrum emitted by LED lighting.

To further reduce human sleep pattern impacts, LED lighting is highly directional and can be distributed with better accuracy than HPS lighting technology. This improved distribution mitigates light trespass into private property and uplight (artificial sky glow) issues inherent to HPS lighting technology.

Unlike HPS lighting technology, LED fixtures do not contain difficult to recycle components (i.e., mercury, lead or hazardous chemicals and gases). LED fixtures are simpler to recycle, consume less electrical power when operating, and can be disposed of with minimal handling requirements.

To address potential interference with radio signal waves, the CSA specified that LED products must meet the FCC 47 CFR part 15 radio emission rules, thereby minimizing the potential of interference with radio signal waves.

The Engineering Department is reviewing the replacement of each individual existing HPS lighting fixture on a case by case basis. This process is intended to:

- Improve existing lighting where possible;
- Minimize potential for light intrusion to private property (i.e., house windows);
- Minimize uplight (artificial sky glow) and glare scenarios; and
- Meet current nationally published roadway lighting standards.

The Engineering Department is confident that this light replacement review will result in better control of light concentration, reduce glare, and improve light uniformity when compared to existing HPS lighting.

### **Product Procurement**

The prices for LED roadway lighting products have been established through the CSA, and purchasing product through the CSA has been endorsed by the City's Purchasing Section. A competitive process for purchasing product is not required, since identical product pricing is offered to all B.C. Hydro customers.

The products chosen for installation in the City were evaluated by an independent engineering consulting firm and were based on:

- Provincial CSA performance criteria;
- Eligibility as direct replacement for HPS lighting fixtures by the B.C. Ministry of Transportation and Infrastructure (*Recognized Products List* – published December 1, 2015);
- Number of available light distribution patterns and user selectable drive currents to meet varying roadway lighting needs;
- Country of origin/manufacture; and
- Purchase price.

Based on the above criteria, the Engineering Department will be installing LED lighting products manufactured by LED Roadway Lighting Ltd. and American Electric Lighting, a division of Acuity Brands Lighting Inc., sold through EECOL Electric Ltd.

These light fixtures include a standardized socket for the implementation of “smart” technology such as dimming, remote connectivity and Wi-Fi. The City is working with PowerTech Labs Inc. (a subsidiary of B.C. Hydro) and will be testing “smart” technologies for future application. In particular, the City plans to pilot Wi-Fi in Newton on 72 Avenue where the LED lights have already been installed.

The estimated quantities of product and related product procurement costs are detailed in Appendix "II". The total estimated product cost for the 2016 LED Roadway Lighting Upgrade Program is \$3,730,000.00, including GST and contingency. Within this total estimated cost, cost sharing available from B.C. Hydro is expected to be \$300,000.00. This results in a net funding requirement of \$3,430,000.00 for the product procurement component of the 2016 LED Roadway Lighting Program.

### **Labour Procurement**

The estimated 2016 contract value for HPS roadway lighting re-lamping activities is approximately \$250,000. As noted in Corporate Report No. R018;2016 approved by Council on February 1, 2016, the Engineering Department recommended eliminating the existing HPS lighting re-lamping program in the current electrical maintenance contract and replacing it with an LED roadway lighting upgrade program.

The City's electrical maintenance contractor, Cobra Electric Ltd., has agreed to replace the labour effort related to HPS roadway lighting re-lamping activities in the current electrical maintenance contract with LED lighting fixture installation activities. Based on revised unit pricing from Cobra Electric Ltd. for LED lighting fixture installation activities, the estimated cost to replace HPS roadway lighting re-lamping activities with LED lighting fixture installation activities is approximately \$320,000.00, including GST and contingency (approximately \$70,000.00 more than currently contracted HPS roadway lighting re-lamping activities). This results in a net funding requirement of \$70,000.00 for the labour component of the 2016 LED Roadway Lighting Program.

In addition, Cobra Electric Ltd. has agreed to take delivery of the LED products acquired by the City through the CSA, provide storage during the installation process and provide environmentally friendly disposal of HPS lighting fixtures at no additional cost.

### **IMPLEMENTATION**

Subject to Council approval, the LED products can be received from the distributor in June. Cobra Electric Ltd. is available to take delivery of the LED products at their facility and can begin installing product immediately after delivery and re-lamping complete by mid-December.

### **SUSTAINABILITY CONSIDERATIONS**

The adoption of LED roadway lighting will assist in achieving the objectives of the City's Sustainability Charter, more particularly the following action items:

- SC11: Public Safety and Security;
- EC3: Sustainable Infrastructure Maintenance and Replacement;
- EC5: Green Infrastructure & Sustainability Grants; and
- EN1: Energy Efficiency.

### **PROJECT FUNDING**

Funding for the 2016 LED Roadway Lighting Upgrade Program is available in the 2016 Roads and Transportation Budget.

## CONCLUSION

The Engineering Department recommends that Council:

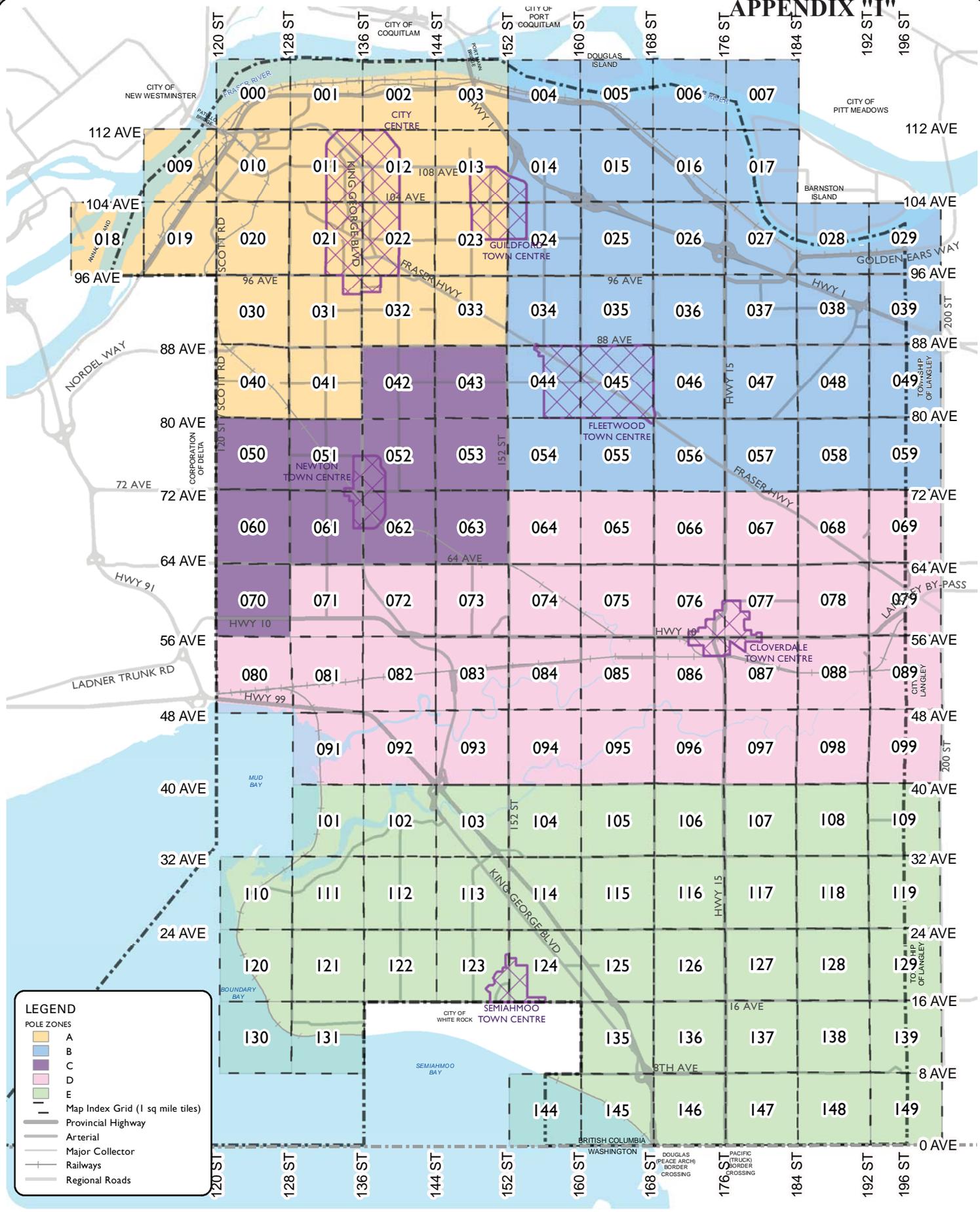
- Receive this report for information regarding the significant benefits and environmental assessment of LED roadway lighting;
- Authorize the product purchase of approximately 6,189 Cobra head style LED roadway lighting fixtures from the Provincial Corporate Supply Arrangement (CSA) to replace existing street light fixtures within City Centre and re-lamp Zone B (see Appendix “I”);
  - That LED Roadway Lighting Ltd. be engaged with an upset limit in the amount of \$2,300,000.00, including GST/PST and contingency, for the supply of 5,001 LED fixtures; and
  - That EECOL Electric be engaged with an upset limit in the amount of \$760,000.00, including GST/PST and contingency, for the supply of 1,188 LED fixtures for intersections and other specific locations requiring brighter lighting levels;
- That LUMCA Inc. be engaged with an upset limit in the amount of \$670,000.00, including GST/PST and contingency, for the supply of 401 City Centre decorative LED fixtures; and
- That the City’s electrical maintenance contractor, Cobra Electric Ltd., be engaged for installation of the LED roadway lighting products in lieu of the contracted re-lamp program at an estimated cost of \$320,000.00, including GST and contingency.

Fraser Smith, P.Eng., MBA  
General Manager, Engineering

JB/SP/RKR/clr/ras

Appendix “I” – Map of Re-lamp Zones

Appendix “II” - Estimated Product Procurement Cost for HPS Lighting Fixture Replacement in North Surrey and City Centre



**LEGEND**

**POLE ZONES**

- A
- B
- C
- D
- E

- Map Index Grid (1 sq mile tiles)
- Provincial Highway
- Arterial
- Major Collector
- Railways
- Regional Roads

# RELAMP ZONES



The data provided is compiled from various sources and IS NOT warranted as to its accuracy or sufficiency by the City of Surrey. This information is provided for information and convenience purposes only. Lot sizes, legal descriptions and encumbrances must be confirmed at the Land Title Office. Source: G:\MAPPING\GIS\Maps\Recurring\trnPoles\_GIS\trnPoles\_RelampZones\_A.mxd Cartographer: em9 © City of Surrey Date: 21-Jan-2016

**APPENDIX “II”****Estimated Product Procurement Cost for HPS Lighting Fixture Replacement in North Surrey and City Centre**

<b>Vender/Supplier of Led Streetlight Fixture</b>	<b>Number of units to be replaced with LED lighting fixtures</b>	<b>Total Estimated LED Fixture Cost including GST/PST From CSA</b>
LED Roadway Lighting (LRL)	5,001	\$2,300,000.00
American Electric Lighting – EECOL Electric Ltd	1,188	\$760,000.00
LUMCA. -City Centre Specified Decorative Fixtures	401	\$670,000.00
<b>Total number of lighting fixtures to be replaced</b>	<b>6,590</b>	<b>Total estimated cost of product \$3,730,000.00</b>