COMMITTEE OF THE WHOLE - JUNE 19, 2012

ENERGY EFFICIENT STREET LIGHT PILOT PROJECT
MOLISE KLEINBURG ESTATES SUBDIVISION - PHASE 1
WARD 1 – VICINITY OF NASHVILLE ROAD AND STEVENSON AVENUE

Recommendation

The Commissioner of Engineering and Public Works recommends:

1. THAT the proposed energy efficient (light emitting diode) streetlight pilot project in the Molise Kleinburg Estates – Phase 1 Subdivision 19T-06V14 be approved; and

2. THAT staff report back to Council on the findings and conclusions of the streetlight pilot project before the assumption of the Molise Kleinburg Estates – Phase 1 Subdivision.

Contribution to Sustainability

The proposed energy efficient (light emitting diodes) streetlight pilot project is consistent with the goals and objectives Green Directions Vaughan and sustainability principles because it involves the use of energy efficient luminaires combined with an alternative lighting level standard that:

- is more energy efficient;
- produces a better quality of light (white light versus amber light);
- has a lower carbon footprint with consideration of the manufacturing process, longer life span and the recycling capability; and
- has lower maintenance costs.

Economic Impact

There is no economic impact associated with the adoption of this report. The Owner of the Molise Kleinburg Estates Inc., development has agreed to undertake the energy efficient streetlight pilot project at no cost to the City.

Communication Plan

As this streetlight pilot project is being carried out in a proposed residential development there is no impact to existing residents. The subdivision agreement for this development includes the requirement for the Owner to include an appropriately worded warning statement in all offers of purchase and sale that informs prospective buyers of this streetlight pilot project.

Purpose

The purpose of this report is to inform Council and seek Council's endorsement of a proposed energy efficient streetlight pilot project in the Molise Kleinburg Estates Inc. – Phase 1 Subdivision (19T-06V14), which is located in the Kleinburg/Nashville Community.

Background

In 2010, the City carried a study to identify the most sustainable and energy efficient lighting technology for the use in streetlight luminaires. The overall findings concluded that light emitting diodes (LED) luminaires are more energy efficient, produce a better quality of light, last longer, and have lower maintenance costs than the more traditional high pressure sodium lamp technology.

Council, at its meeting on May 4, 2010, resolved as follows:

> "Staff undertake a review of the City's engineering design criteria and standards to assess the appropriateness of requiring the use of LED (Light Emitting Diodes) luminaire technology in new and retrofit situations wherever practical."

Over the period between 2010 and 2011, the City retrofitted approximately 1,400 existing streetlights in mainly industrial areas to LED luminaires. By all accounts, this retrofit project was a notable success. A report on the findings of this retrofit project will be brought forward to Council in the fall 2012.

Staff continues to identify opportunities to implement LED streetlights in new developments

It is important to maintain a consistent and uniform streetlight style, luminaire and lamp type throughout a given neighbourhood. Accordingly, there has been limited opportunity to transition from the traditional high pressure sodium (HPS) streetlights to a LED luminaire in the current developing areas in Maple and Woodbridge. However, the proposed low density developments in the Kleinburg/Nashville Community present an excellent opportunity for the application of LED streetlight technology.

Molise Kleinburg Estates has expressed an interested in undertaking a LED streetlight pilot project

The Molise Kleinburg Estates Phase 1 Subdivision is located south of Nashville Road and west of Stevenson Avenue as shown on Attachment No.1. The first phase of this subdivision is comprised of 69 residential estate lots ranging from 0.5 acres to 1.0 acres in size. This subdivision is not a continuation of an existing residential subdivision and is well buffered by open space from the existing residential community. In addition, the municipal services in this subdivision have been designed to be more sustainable and environmentally friendly, and include roadways with a semi-rural character with enhanced road side swales to promote water quality treatment and infiltration of surface water.

The Molise Kleinburg Estates development was progressing through the approval process at about the same time as the City endorsed the use of LED streetlights in new developments. The location and environmentally friendly character of this development made it a prime candidate for the application of LED streetlights. With this in mind, the developers propose to use decorative coach style LED streetlights in the first phase of the development conditional on using a light level that was consistent with the Illuminating Engineering Society of North America (IESNA) standards, and in keeping with the character of the subdivision. The use of this light level will reduce the required streetlight infrastructure in the subdivision, which will help off-set the current higher capital cost associated with the supply of LED luminaires.

Illuminating Engineering Society of North America recommends appropriate lighting levels

The City's current streetlighting standards require residential roadways to be lit to a light level of 6.0 LUX with a light uniformity ratio of 6:1. This standard was established a number of years ago to provide a high level of service to the public and to mitigate the shading effects of boulevard trees over time.

The Illuminating Engineering Society of North America (IESNA) recommends a lighting level of 4.0 LUX with a light uniformity ratio of 6:1. The IESNA standard is recognized as the best practice for lighting roadways in North America. Locally, most major municipalities in the GTA, including Toronto, Mississauga, Markham, Richmond Hill, Aurora, Brampton, Barrie, and Hamilton amongst others, all have their municipal lighting standards aligned with the IESNA recommended levels. In comparison to the IESNA, the City's current lighting standard requires on average approximately 30% more luminaires to be installed, operated, and maintained on local municipal roadways.

If the City followed step with IESNA and its neighbouring municipalities with respect to streetlight standards, then the City could realize an overall reduction in energy consumption regardless of the type of luminaire technology being used.

The Molise Kleinburg Subdivision provides an opportunity to pilot LED luminaires at an alternative light level

The lower density of residential dwellings within the Molise Kleinburg phase 1 development results in the placement of streetlights, boulevard trees, and driveways at a greater separation distances than would normally be found in traditional residential developments. Within this subdivision, the average separation distance between the streetlight and boulevard tree is 12 metres, whereas in most residential developments this average separation distance is approximately 6 metres. The separation distance of 12 metres in this subdivision addresses the concern of the boulevard tree canopies crowding the streetlights over time and further reducing the lighting levels in the future. Accordingly, this subdivision is an ideal location to pilot alternative streetlighting levels. The use of LED streetlight luminaires at alternative lighting levels will further complement the use of road side enhanced swales and provide an opportunity to assess environmentally sustainable opportunities to reduce energy consumption and light pollution for future development projects.

The proposed LED pilot project is expected to offer energy savings to the City while maintaining industry standard light levels

The City's 2010 Energy Efficient Streetlight Study concluded that LED streetlights have a longer life span and are more energy efficient. The currently used HPS has a typical life expectancy of 24,000 hours, compared to the LED streetlight which has a life expectancy of 70,000 -10,000 hours.

To quantify the potential energy savings that could be realized by using LED luninaires in the Molise Kleinburg Estates phase 1 subdivision, the streetlight system in the development was design under two scenarios; (1) HPS luminaires at current City Standards and (2) LED luminaires at IESNA standards.

Under scenario one, a total of 71 streetlights would be required in the Molise Kleinburg subdivision to meet the City's current standards (6.0 LUX with a light uniformity ratio of 6:1). Using HPS luminaires, the energy cost would be approximately $1,665 per year, not including maintenance. In comparison, a streetlight system using LED luminaires and design to meet IESNA stardards (4.0 LUX with a light uniformity ratio of 6:1) would only require a total of 50 streetlights with annual energy consumption valued at approximately $1,170. Accordingly, based on an initial assessment of the net benefits of the Molise pilot project, a streetlight system using LED luminaires and designed to meeting IESNA standards could potentially offer savings to the City of approximately $495.00 per year in energy costs (approximately $10/year in savings per fixture) or approximately 30% less energy consumption than a typical system. Lower energy consumption and less infrastructure will greatly reduce the overall lifecycle costs of the streetlight system. Accordingly, staff is recommending that the Council endorse the proposed LED streetlight pilot project in the Molise Kleinburg Estates phase 1 subdivision.

The success of the Pilot Project will be evaluated and documented

The proposed streetlight pilot project has been structured to evaluate the benefits of two main parameters; firstly the use of LED luminaires versus the current standard of High Pressure Sodium (HPS), and secondly the use of 4.0 LUX lighting level recommended by the Illuminating Engineering Society of North America (IESNA) versus the current City standard of 6.0 LUX. A comprehensive evaluation process and procedure will be developed following the endorsement of the pilot project. Staff will report back to Council on the findings and conclusions of the streetlight pilot project before the assumption of the Molise Kleinburg Estates – Phase 1 Subdivision.

Relationship to Vaughan Vision 2020 / Green Directions Vaughan

In consideration of the strategic priorities related to Vaughan Vision 2020, and the "Green Directions Vaughan" (which is the Community Sustainability and Environmental Master Plan), this streetlight pilot project will complement/assist the following:

- Enhance and Ensure Community Safety, Health & Wellness;
- Lead and Promote Environmental Sustainability;
- Pursue Excellence in Service Delivery; and
- Actions planned under Objective 2.1.4 of the Community Sustainability and Environmental Master Plan: - "Examine Energy Conserving Streetlight Pilots"

Regional Implications

There is no Regional implication resulting from the adoption of the report.

Conclusion

In 2010, Council directed staff to assess the appropriateness of requiring the use of LED (Light Emitting Diodes) luminaire technology in new developments. The Molise Kleinburg Estate Subdivision provides an opportunity to further pilot the use of LED luminaires in a residential neighbourhood, and the application of the 4.0 LUX lighting level recommended by the Illuminating Engineering Society of North America rather than the current City standard of 6.0 LUX to reduce energy consumption. Based on an initial assessment of the proposed pilot project, it is expected that there will be a net financial benefit to the City so staff is recommending that Council endorse the initiative.

Attachments

1. Molise Kleinburg Estates Phase 1 Subdivision - Location Plan

Report prepared by

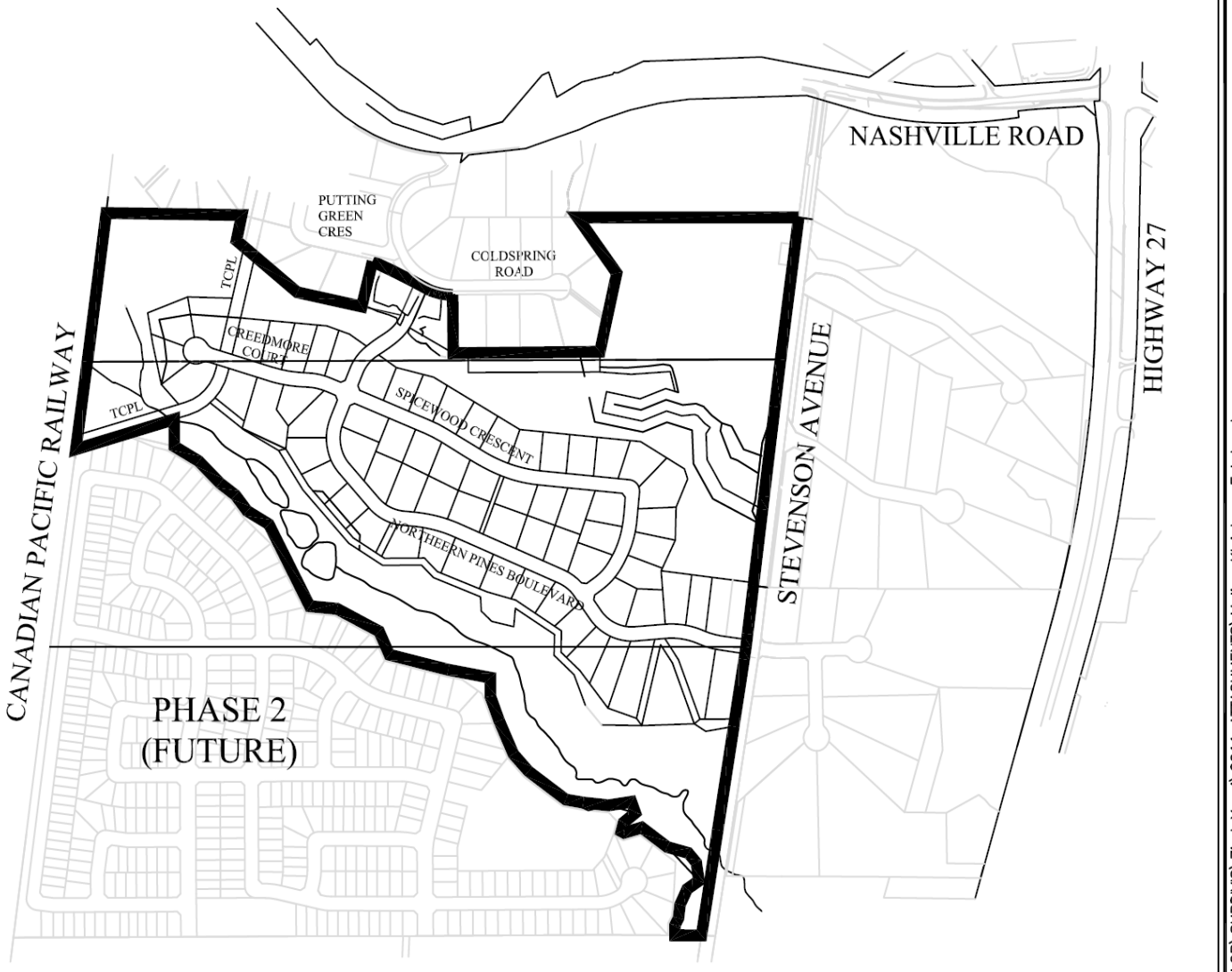
Andrew Pearce, Director of Development & Transportation Engineering, Ext. 8255

Respectfully Submitted,

Paul Jankowski, P. Eng.
Commissioner of Engineering and Public Works

Andrew Pearce, C.E.T.
Director of Development/
Transportation Engineering

ATTACHMENT No. 1



MOLISE KLEINBURG ESTATES SUBDIVISION PHASE 1 19T-06V14

LOCATION : Part of Lots 22 & 23, Concession 9

LEGEND

SUBJECT LANDS

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NOT TO SCALE

Drawing name: O:\Engineering Services\Design Services\Design Drafting\$DEVELOP\SUBDIVIS\Ziad Yassi\2011 ATTACHMENTS\Molise Kleinberg Estates.dwg

CITY OF VAUGHAN – ENGINEERING SERVICES DEPARTMENT

DRAFTSPERSON: G.S.