

BRIGHT SKIES

EXECUTIVE SUMMARY

This report assesses policy and regulatory responses to the effects of poorly directed light and light pollution. It examines existing regulations in regards to outdoor lighting and recommends possible policy amendments to support these regulations.

ADMINISTRATION RECOMMENDATION(S)

That the SPC on Planning and Urban Development recommend that Council:

1. Forward this report to the 2013 April 08 Public Hearing of Council; and
2. Adopt, by bylaw, the proposed amendment to the Municipal Development Plan as contained in Attachment 1.

PREVIOUS COUNCIL DIRECTION / POLICY

At the 2012 September 10 Regular Meeting of Council, it was Moved by Alderman Pincott, Seconded by Alderman Pootmans, that Aldermen Pincott's Motion, Bright Skies, NM2012-37 be adopted. The Notice of Motion directs Administration to develop policy and guidelines for lighting within the City of Calgary that will address issues of light pollution, light trespass and light egress, to return to Council through the SPC on Planning and Urban Development no later than 2013 February.

BACKGROUND

Lighting has a major positive effect on the urban environment. Unfortunately along with these positive effects, comes the impact of light trespass, light illuminating property and/or other environments unintentionally.

Poorly directed light can have a number of adverse environmental, economic and social effects. Negative effects of light pollution include impacts to human immune function and general health, behavioural changes in insect and animal ecosystems, and a decrease in both ambient quality and safety in urban night time environments. A poorly shielded light source can cast approximately 30% of light directly into the sky.

The Rothney Astrophysical Observatory is located just outside Calgary city limits. This is one of the three largest telescopes in Canada. It is used for research and learning for students at the University of Calgary. The increasing brightness of the city of Calgary (as a result of its growth) is adversely affecting the telescope. The brighter the ambient light in the sky, the more difficult it becomes to observe stars and other astrophysical objects. The effects of light pollution on the observatory, as well as other property and the environment, could be reduced through responsibly directing light downwards, rather than into the night sky.

There are existing City of Calgary policies that examine lighting techniques. The Centre City Illumination Guidelines is a non-statutory document that provides a vision of lighting techniques in the Centre City area. It acts as a guidance document for accent lighting which respecting the night sky and reducing light trespass. The Bird-friendly Urban Design Guidelines encourage responsible lighting to reduce avian mortality in urban areas. Light pollution has adverse effects on bird populations. This document also speaks to interior lighting inside buildings at night, which may attract birds, contributing to mortality.

BRIGHT SKIES

In 2002 the Roads Department began the EnviroSmart program to retrofit streetlights to increase energy efficiency and reduce light spill into the sky. This program is widely regarded as a success in terms of preserving the night sky and reducing the environmental and economic impact of wasted light.

Land Use Bylaw 1P2007 includes city-wide lighting provisions. These regulations were created to give the Development Authority control over lighting on private property for new development or redevelopment projects. The key purpose of the regulation is to restrict brightness and to direct light downwards, rather than into the sky, or onto adjacent parcels or streets.

INVESTIGATION: ALTERNATIVES AND ANALYSIS

There are a number of ways to regulate outdoor lighting through policy, guidelines, or regulation.

Option 1: Develop policy in the Municipal Development Plan (MDP) to support existing regulations in Land Use Bylaw 1P2007.

The Land Use Bylaw currently contains lighting regulations that apply city-wide. The purpose of the regulations is to reduce urban sky glow, light trespass and glare. The regulations contain provisions for shielding, mounting of fixtures, height limits and canopy lighting. The provisions are straightforward for staff, industry and the public to understand. They are also measurable with the 'naked-eye', which eliminates the need for expensive light-measurement equipment. Applicants are required to submit a lighting plan when applying for new developments. Proposed lighting is assessed for compliance with the Land Use Bylaw. These plans may be circulated to a Crime Prevention through Environmental Design (CPTED) representative, if it is identified that there be safety issues associated with the development.

Analysis of existing regulation has determined that there is sufficient regulation in Land Use Bylaw 1P2007 to effectively control outdoor lighting; however, there is a lack of policy in the MDP to support the Land Use Bylaw regulations. A statutory policy in the MDP for light pollution would have the added benefit of ensuring that light trespass could be considered earlier in the land development planning stages and during the drafting of City guidelines, statutory plans and non-statutory plans. The approach would also allow Administration to investigate other methods of policy implementation, through the MDP Implementation and Effectiveness Monitoring Program, such as education and incentives as a way to address existing light pollution.

Administration recommends Option 1 to amend the MDP in order to support the existing Land Use Bylaw regulations with policy. The amendment would expand MDP section 2.4.3 *Enhancing the public realm*, policy "f". This policy currently addresses adherence to CPTED principles. It would be amended to include responsible outdoor lighting as an additional consideration in the design of buildings, open spaces, pathways and parking areas (Attachment 1).

BRIGHT SKIES

Option 2: Develop a detailed policy to direct a technical guideline document to regulate outdoor lighting in Calgary

Administration examined a number of model ordinances and guidelines from other municipalities and considered the possibility of drafting a technical document that provides specific and prescriptive standards for outdoor lighting. In order to develop a technical guideline, detailed policy would be necessary to provide direction to the document. The technical guidelines could be included as provisions in the Land Use Bylaw or could potentially exist as their own separate document.

Analysis showed that this type of document would not be an optimal use of resources. The technical nature of a specification document would require a high level of training for industry and staff, especially development planners/reviewers of lighting plans and enforcement. Additionally it would require an up-front investment for light-measurement equipment. enforcement at The City operates on a complaint-driven basis. The number of lighting-related complaints received is very low; therefore, the investment in equipment and training would likely not have a net benefit.

Stakeholder Engagement, Research and Communication

Administration consulted with Dr. Phil Langill, an Astrophysics professor at the University of Calgary, and the Director for Rothney Astrophysical Observatory. Dr Langill is concerned with growing light pollution and the influence on making observations in the night sky.

Administration also took into account the research of Dr Chris Kyba, from the Free University of Berlin. Dr Kyba specializes in the ecological and health impacts effects of light pollution. His current research focuses on light and darkness as powerful drivers of animal behaviour.

A number of model ordinances and guidelines were considered in addition to numerous documents from the International Dark Sky Association, The Royal Astronomical Society of Canada and the Illuminating Engineering Society.

Strategic Alignment

The proposed amendment to the MDP aligns with the other policies in the MDP and provides additional policy in regards to lighting. The policy also aligns with existing Lighting Regulations in Part 3, Division 4 of Land Use Bylaw 1P2007.

Social, Environmental, Economic (External)

Social

Light that is poorly directed may not be effectively lighting public areas such as parks, streets and parking areas. This may result in CPTED concerns. Excessive glaring light can result in reduced visibility and be a detriment to personal safety. Outdoor areas should be designed with respect to the principles of CPTED, while at the same time responsibly directing light to where it is needed, instead of into the sky, adjacent property or other environment. Additionally the human health effects of light are well-researched. Excessive amounts of artificial light during night time hours can affect sleep patterns, which in turn affect health and happiness.

BRIGHT SKIES

Environmental

Light egress, light trespass and light pollution produce a number of environmental concerns. Non-renewable resources are used to produce electricity (the majority of electricity in Alberta is generated from coal). It is in the interest of the environment to properly shield and direct outdoor light, and not waste resources by shining light where it is not needed.

Economic

Poorly directed light is not only wasteful of limited resources, it is also economically inefficient. Higher wattage bulbs that are improperly shielded could be replaced by dark-sky friendly fixtures with lower wattage bulbs. Existing lighting can be retrofitted. The cost to landowners would not be significant, and savings through energy efficiency may offset up-front costs.

Financial Capacity

Current and Future Operating Budget:

None

Current and Future Capital Budget:

None

Risk Assessment

Administration has identified the following risks:

Existing approved lighting may continue to exist as per non-conforming clauses in the Land Use Bylaw and the Municipal Government Act. Therefore significant reductions in overall light pollution in the short term may not occur. However in the longer term, through redevelopment the new policy and the regulations in the Land Use Bylaw can be applied, reducing light pollution and directing light responsibly.

The City of Calgary's enforcement for planning matters is complaint-driven. Non-compliance with lighting policy and regulation may not be identified, unless a neighbour is adversely affected. Limited resources in enforcement departments may result in non-compliance with the regulations, without any enforcement action taken.

Public education on light pollution is slowly increasing, but for the most part, it is limited. Without public awareness of the issues surrounding the effects of poorly directed outdoor lighting, property owners could unknowingly install improperly shielded fixtures. This also contributes to a lack of enforcement on lighting related infractions, since the number of complaints will likely remain low. As public awareness increases on light pollution and its economic, environmental and social effects, this risk will be decreased.

REASON(S) FOR RECOMMENDATION(S):

Existing provisions in Land Use Bylaw 1P2007 effectively prevent light trespass from exterior light fixtures. Administration recommends supporting these existing provisions with statutory policy in the MDP. This will encourage that lighting concerns be considered earlier in the land development planning stages and during the drafting of City guidelines, statutory plans and non-statutory plans.

BRIGHT SKIES

ATTACHMENT(S)

1. Proposed Amendment to the Municipal Development Plan
2. Comparison of Option 1 and Option 2