

Approved: February 27, 2009  
Date

MINUTES OF THE HOUSE ENERGY AND UTILITIES ENERGY EFFICIENCY SUB-COMMITTEE

The meeting was called to order by Sub-Committee Chairman Rob Olson at 11:00 a.m. on January 30, 2009, in Room 783 of the Docking State Office Building.

All members were present except:

Representative Rocky Fund- excused  
Representative Dan Johnson- excused  
Representative Forrest Knox- excused  
Representative Annie Kuether- excused  
Representative Margaret Long- excused  
Representative Tom Moxley- excused  
Representative Cindy Neighbor- excused  
Representative Connie O'Brien- excused  
Representative Richard Proehl- excused  
Representative Joe Seiwert- excused  
Representative Josh Svaty- excused  
Representative Vern Swanson- excused  
Representative Vince Wetta- excused

All Sub-committee members were present.

Committee staff present:

Melissa Doeblin, Office of the Revisor of Statutes  
Mary Galligan, Kansas Legislative Research Department  
Cindy Lash, Kansas Legislative Research Department  
Renaë Hansen, Committee Assistant

Conferees appearing before the committee:

Robert Wagner, International Dark-Sky  
Steve Scanlan, US Army  
Connie Ohlmer, KDHE  
Rick Brunetti, Bureau of Air and Radiation  
Tom Thompson, Sierra Club  
Nathan Eberline, League of Kansas Municipalities

Others attending:

Nineteen including the attached list.

Hearing on:

**HB 2064 - Light pollution; night sky protection act.**

Proponents:

Robert Wagner, International Dark-Sky (Attachment 1), spoke to the committee in favor of **HB 2064**.

Questions were asked and comments made by Representatives: Carl Holmes, Tom Sloan, Gail Finney, Mike Burgess, and Tony Brown.

Written Proponents:

Steve Scanlan, US Army (Attachment 2) offered written testimony in favor of **HB 2064**.

Rick Brunetti, Bureau of Air and Radiation (Attachment 3), presented written testimony in favor of **HB 2064**.

Opponent:

Tom Thompson, Sierra Club (Attachment 4), spoke to the committee in opposition to **HB 2064**.

CONTINUATION SHEET

Minutes of the House Energy And Utilities Committee at 9:00 a.m. on January 30, 2009, in Room 783 of the Docking State Office Building.

The hearing on **HB 2064** was closed.

The next meeting is scheduled for February 2, 2009.

The meeting was adjourned at 12:10 p.m.

# INTERNATIONAL DARK-SKY ASSOCIATION

SINCE 1988

"... TO PRESERVE AND PROTECT THE NIGHTTIME ENVIRONMENT AND  
OUR HERITAGE OF DARK SKIES THROUGH QUALITY OUTDOOR LIGHTING."

Kansas House Energy & Utilities Committee  
Sub-Committee meeting on Energy Efficiency issues

**Rob Olson, Chair**

Hearing on HB 2064 – Night Sky Protection Act  
January 30, 2009

Mr. Chairman and Members of the Committee:

Thank you for the opportunity to speak with you today. I am Robert Wagner, Board Member of the International Dark-Sky Association. Our non-profit organization has a simple mission: *To preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting.* To this end, we are supporting the Night Sky Protection Act.

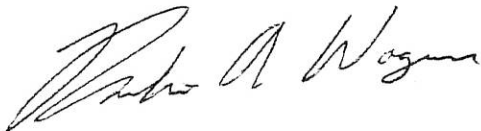
Light Pollution is increasing at an average rate of 6%-10% annually across the US. In researching this issue, I have found that as many as one-third of Kansas State Parks are in excellent condition while two-thirds have moderate to severe Light Pollution problems. I was unable to locate a State Park that could be considered having a completely Light Pollution free night sky.

The opportunity to spend a night under the stars is rooted deep in our history. Many cultures used this as a right of passage. Alone, a youth had to separate themselves and go deep into the wilderness. Subjected to a time of deep insight and contemplation, they were no longer judged by their peers, but by something greater. The stars themselves were seen as the watchful eyes of their ancestors and powerful spirits. Concepts such as duty, honor, courage and integrity were allowed to foster away from life's daily hassles. When insight was attained, the youth returned an adult.

The Kansas motto "Ad astra per aspera", *To the stars through difficulties*, helps us understand the regard our ancestors had for the stars. They adorn the state seal, state flag and US flag. According to a book about the flag published by the House of Representatives in 1977, the star symbolizes "the heavens and the divine goal to which man has aspired from time immemorial".

This issue is not about banning lighting, but educating the public on good lighting practices. Practices that provide safety and security while minimizing the impact of stray light leaving the property, entering neighbor's windows or illuminating the night sky. By adopting a long-term strategy, we can facilitate positive changes as light fixtures need replacement.

The real question you are being asked to vote upon is whether future generations will have the opportunity to view the unimpaired night sky in Kansas or will they eventually only be able to see it elsewhere.



Robert Wagner  
Board Member  
International Dark-Sky Association  
<http://www.darksky.org>

**MANAGING DIRECTOR**  
PETE STRASSER

**EMERITUS**  
DAVID L. CRAWFORD, PHD

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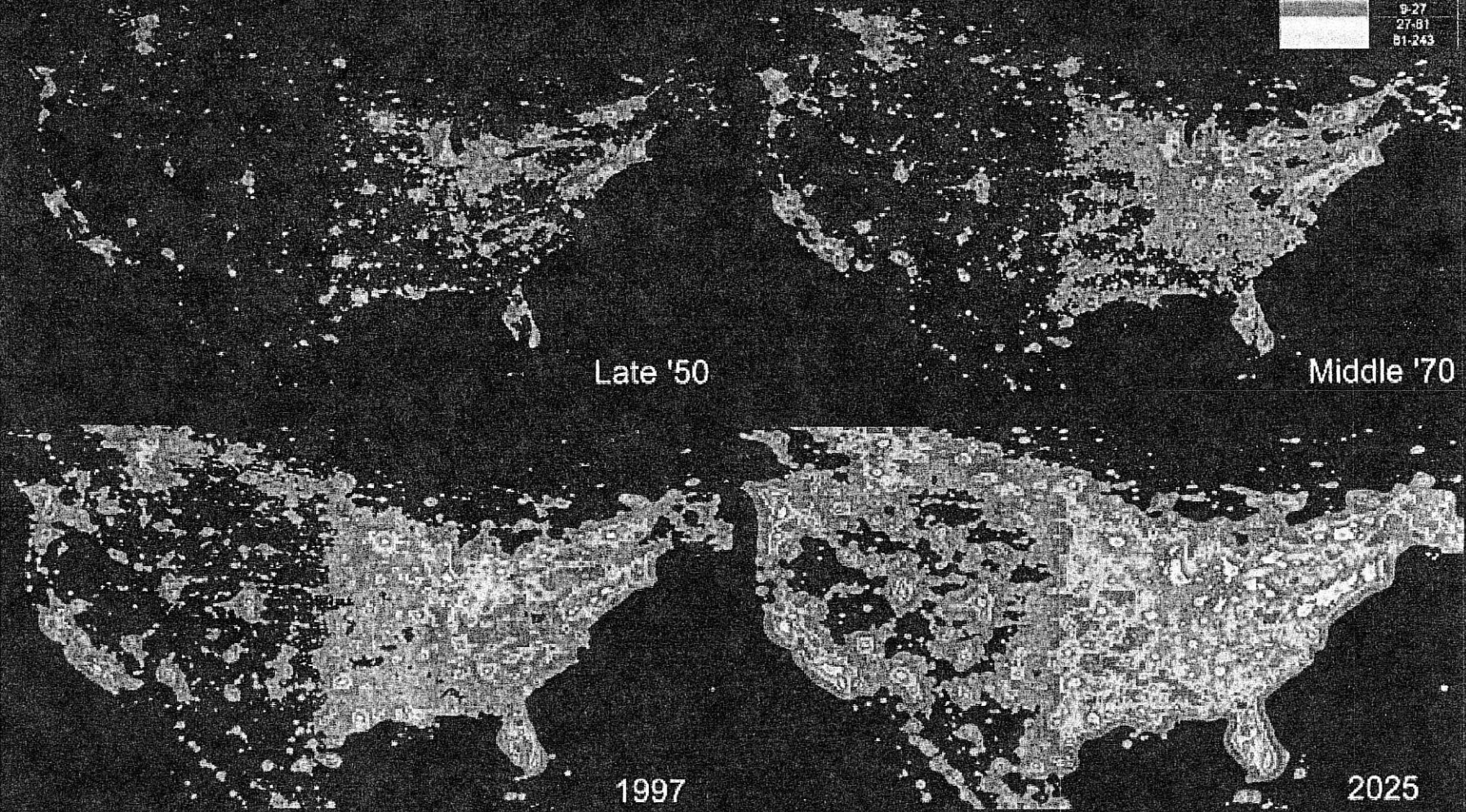
REGINALD WILSON  
LIGHTING ANALYSIS & DESIGN  
SYDNEY, AUSTRALIA

# Artificial Night Sky Brightness due to Light Pollution in North America

A preliminary picture of the growth from 1950 to 2025

Artificial night sky brightness at zenith, at sea level, for standard clean atmosphere as fraction of the average natural night sky brightness

Dark grey	<11%
Medium-dark grey	11%-33%
Medium-light grey	33%-100%
Light grey	1-3
Very light grey	3-9
White	9-27
White	27-81
White	81-243



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1-2

## Light Pollution State Summary

California Executive Order D-19-01 "...shall substantially reduce maximum outdoor lighting capability during non-business hours.." – Basically, turn off unnecessary lights

New Mexico September 13, 2007 – Governor Richardson proclaims September 14 'NM Dark Sky Appreciation' Night. "Initiated in 2004, New Mexico State Parks "Reach for the Stars" program is a multi-faceted effort that promotes the night sky as a valuable educational, tourism and economic resource, while encouraging the protection of New Mexico's night sky from light pollution."

Oregon Policy Manual – Executive Order # E0-00-07; EO-03-03; ORS 184.421 through 184.470 "Install light fixtures and limit their use to reduce light pollution"

Wisconsin Executive Order# 145 – Green Buildings – "In addition, these guidelines will address sustainable operation and recycling, pollution prevention, energy and water efficiency, and light pollution in existing buildings."

Various, including Kansas have energy efficiency Executive Orders.

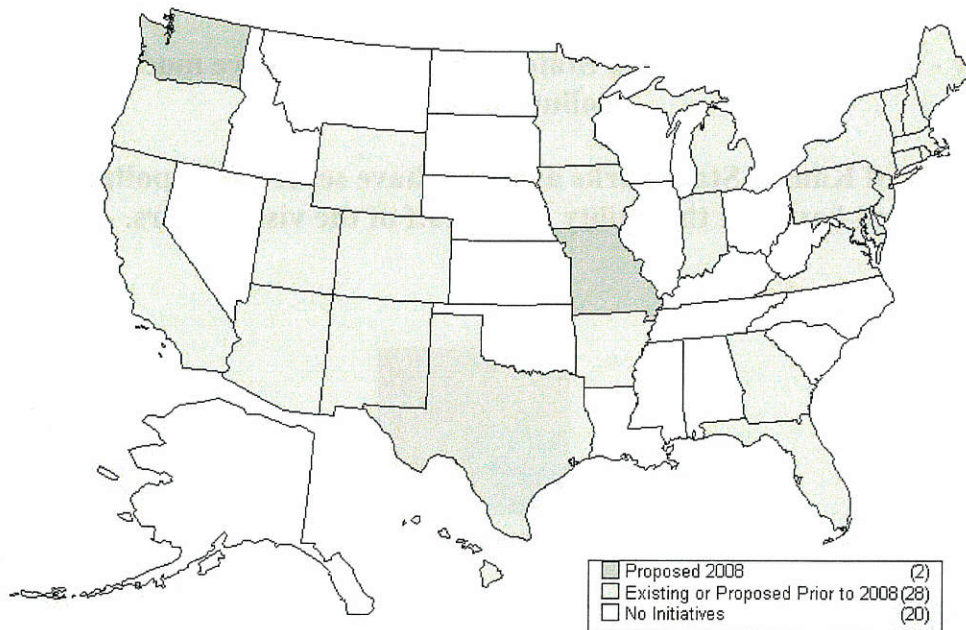
### Existing Laws

- Arizona: Title 49, Chapter 7 - Light Pollution (1991)
- Arkansas: Title 8, Chapter 14, Shielded Outdoor Lighting Act
- California: Section 7 of SB 5, signed April 2001, amends 25402.5. and establishes control of all outdoor lighting by the California Energy Commission (CEC). Page 76 (b).
- Colorado: Title 24, Article 82, Part 9 (24-82-902).
- Connecticut: Various: Floodlights intended for private property illumination located within the state right-of-way on state highways; Highway and roadway lighting; Outdoor luminaires on the grounds of state buildings or facilities; State Building Codes, page 89
- Delaware: Title 7, Chapter 71A.
- Maine: Title 5, Chapter 153, Subchapter 1-A, Section 1769
- Minnesota: CHAPTER 296--S.F.No. 3337 Article 2
- New Mexico: Article 12 – Night Sky Protection, 74-12-1 through 74-12-11
- Rhode Island: Title 42, Chapter 42-136 Outdoor Lighting Control
- Texas: Amendment to Health and Safety Code, Chapter 425, Regulation of Certain Outdoor Lighting

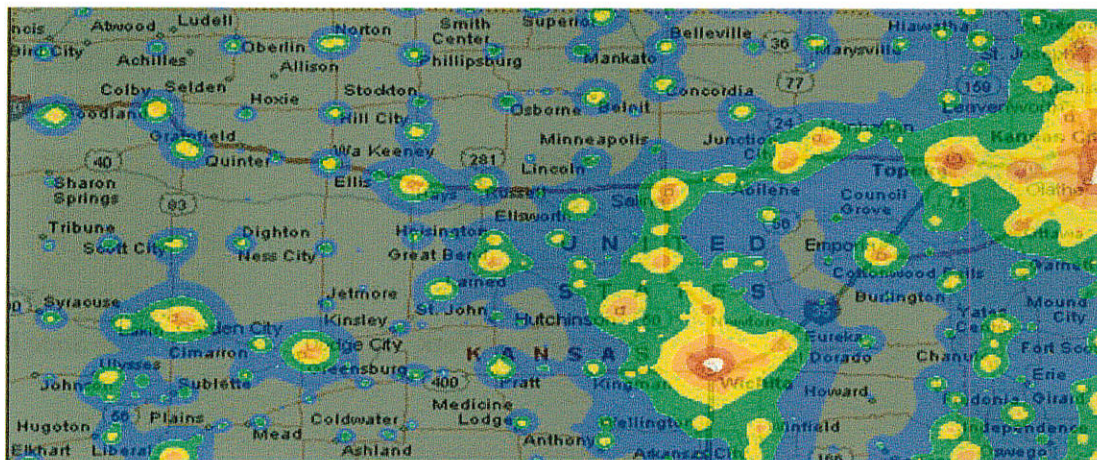
Some Proposed – 30 total states with Existing Laws or Proposed

- Texas: An Act relating to the Authority of counties to regulate outdoor lighting near major astronomical observatories (2001)
- California: Executive Order D-19-01 regarding retail establishments, state of emergency (2001)
- Connecticut: HB 5684 - The bill bans, with some exceptions, the use of state bond revenues or appropriated or allocated state funds to install or replace an outdoor light or lighting unit on state building or facility grounds that:
  1. fails to maximize energy conservation and minimize light pollution, glare, and light trespass (light that shines beyond the boundaries of the property where it is located);
- Pennsylvania: House Bill 300 (2001) Providing for management of outdoor night lighting and a penalty.
- Missouri: House Bill 1727 (2008) Reducing light pollution over state parks and other protected areas.
- New Hampshire: House Bill 222-FN (2001) And act relative to lighting and light pollution.
- New York: An Act to amend the environmental conservation law and the public service law, in relation to the management of outdoor night lighting to conserve energy and to protect the nighttime environment.

# States with Light Pollution Initiatives



2008 Robert Wagner



Artificial night sky brightness at zenith, at sea level, for standard clean atmosphere as fraction of the average natural night sky brightness

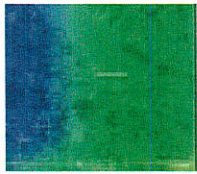
	<11%
	11%-33%
	33%-100%
	1-3
	3-9
	9-27
	27-81
	81-243

# Kansas State Parks Light Pollution impact - 1997 Study

**Summary - Two-thirds of Kansas State Parks analyzed have moderate to severe light pollution problems.**

**Over 40% of Kansas State Parks analyzed have severe light pollution problems and have lost the ability to see half of the visible stars. - RW**

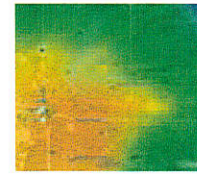
## Light Pollution Impact - Severe



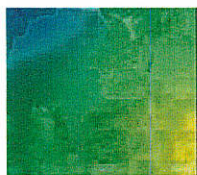
Cheney State Park



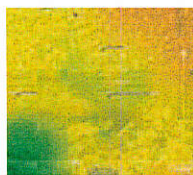
Clinton State Park



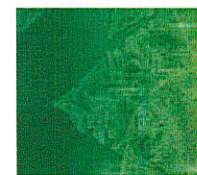
El Dorado State Park



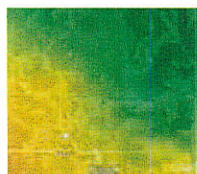
Elk City State Park



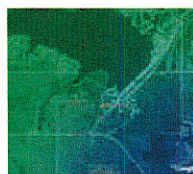
Hillsdale State Park



Milford State Park



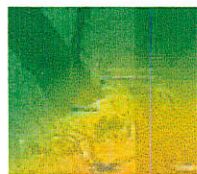
Perry State Park



Pomona State Park



Sand Hills State Park

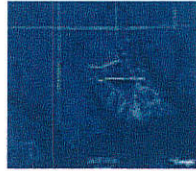


Tuttle Creek State Park

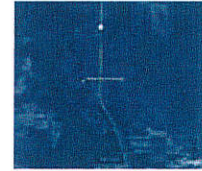
**Light Pollution Impact - Moderate**



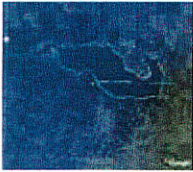
Crawford State Park



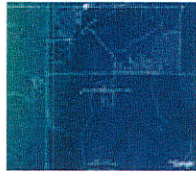
Eisenhower State Park



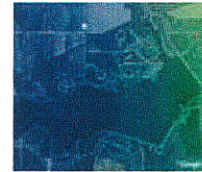
Kanopolis State Park



Lovewell State Park

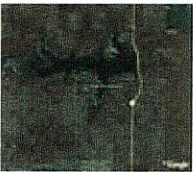


Mushroom Rock State Park

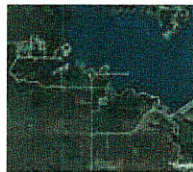


Prairie Dog State Park

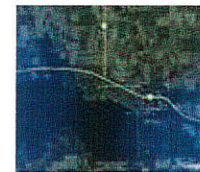
**Light Pollution Impact - Slight**



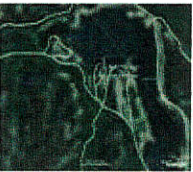
Cedar Bluff State Park



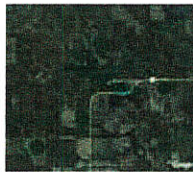
Fall River State Park



Glen Elder State Park



Lake Scott State Park



Meade State Park



Toronto State Park



Webster State Park



Wilson State Park

**As a rough estimate - around Green you lose approximately half of the visible stars and around Orange you lose three-fourths. - Robert Wagner**



## Kansas Night Sky Preservation Act State Protected Areas - Status based on 1997 survey

Area	> 2x	2x - 30%	30% - 10%	< 10%
<b>State Parks</b>				
Cedar Bluff				XX
Cheney		XX		
Clinton	XX			
Crawford			XX	
Cross Timbers				XX
Eisenhower			XX	
El Dorado	XX			
Elk City		XX		
Fall River				XX
Glen Elder				XX
Hillsdale	XX			
Kanopolis			XX	
Lake Meade				XX
Lovewell			XX	
Milford		XX		
Mushroom Rock			XX	
Perry	XX			
Pomona		XX		
Prairie Dog			XX	
Sand Hills	XX			
Scott				XX
Tuttle Creek	XX			
Webster				XX
Wilson				XX
<b>Other</b>				
Cimarron National Grassland			XX	
Quivira NWR				XX
Tallgrass Prairie National Preserve			XX	
<b>Total</b>	<b>6</b>	<b>4</b>	<b>8</b>	<b>9</b>
27	22.2%	14.8%	29.6%	33.3%

## A case for performance based outdoor lighting utility rates

Most current utility rates are based on energy use of a specific lamp. The rate case may list the amount of light (lumens), type (HPS, MH), wattage and estimated kWh and a price. In most cases there are no requirements that any of the light emitted by the fixture actually results in usable light on the ground or a replacement fixture results in better or similar lighting performance. In fact, replacement fixtures may result in worse lighting performance as companies migrate toward less expensive fixtures. Lighting is typically locked in at a specific wattage and type.

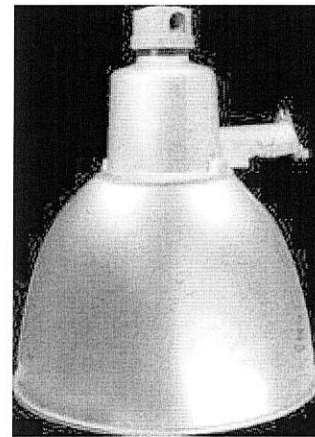
This model doesn't provide incentives for a utility company to invest in energy efficiency, energy conservation or innovation. If a better way of lighting comes along, the company must spend the time and money to refile a rate case. The may take over a year to adopt, thus slowing adoption.

How do we allow utilities to adopt more energy efficient lights, and energy conservation practices? How do we facilitate the adoption of LED lights, luminaires that emit more useful light on the ground and less into the night sky? How can we incorporate activity based intelligent lighting such as motion detectors and intelligent streetlight dimming based on traffic volumes?

Here is an example: [http://www.rabweb.com/product\\_line\\_detail.php?prodline=YRDBLS](http://www.rabweb.com/product_line_detail.php?prodline=YRDBLS) Look at the Yardblaster vs. the Downblaster. If the Downblaster puts 45% more light on the ground, you may be able to replace a 150W Yardblaster with an 85W Downblaster (if it existed, just an example) and get the same or better performance on the ground.



Left, *Yardblaster* 150W High Pressure Sodium Light manufactured by RAB Lighting, Inc.



Right, *Downblaster*, 70W High Pressure Sodium Light manufactured by RAB Lighting, Inc. "Full cutoff with 45% more downlight than conventional barn lights."

If the 150W Yardblaster and the 85W Downblaster cost the same, then the utility would profit on the wattage saved. If it costs less, then they would make even more profit and the customer gets a light with the same or better performance characteristics for the same price.

We believe that a better way must be adopted to facilitate energy efficiency, energy conservation and innovation. To this end, we recommend rate cases be changed to performance based.

Instead of the rate being based on a specific light type and wattage, it should be based on the amount of usable light for a specific area on the ground. Something such as a minimum of X Lux average covering YY m<sup>2</sup> when activity occurs for Yard lights. Intelligent streetlight rates should be based on traffic volume as well as performance. Additional characteristics such as color may or may not be included in the rate case.

To quickly move toward the adoption of performance based lighting, we would like to recommend that utility regulators develop guidelines for a conversion of existing area and street lights to a performance based system without modification to the rates scale. This would allow new and replacement lights to be more efficient and conservation oriented while maintaining minimum performance standards for the customer.

### Sample Conversion Guidelines

#### Private Area Lights

- Performance will be based on a 20 foot fixture height
- Performance will be based on the largest quantity of installed fixtures
- Average luminance shall not be less that 2 Lux
- Sodium based lights are not considered color critical when not located near an observatory and may be replaced with sodium or white lights
- Metal Halide lights shall only be replaced with a white light
- Replacement fixtures must be installed at the same height as existing fixtures unless customer agrees to a modification in fixture height
- Existing aspects for rate case, such a additional costs for nonstandard units, interest rates, adjustments and surcharges remain unchanged

### Sample Utility Submission

#### Performance Conversion Example - Private Area Lights

Sample Company

Existing Rates						Converted To*		
Lamp	Lumens	Wattage	Type	kWh	Standard Price	Activity Area	Average Luminance	Color
HPS	5,700	70	Space	68	\$8.37			any
HPS	14,500	150	Space	115	\$12.86			any
HPS	14,500	150	Flood	115	\$13.04			any
HPS	45,000	400	Space	290	\$30.11			any
HPS	45,000	400	Flood	290	\$29.91			any
MH	13,500	250	Flood	182	\$22.80			white
MH	24,000	400	Flood	305	\$32.14			white

HPS - High Pressure Sodium  
MH - Metal Halide

\*New specs are minimum performance standards, replacement lights must meet these standards when activity occurs in the Activity Area



DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY  
INSTALLATIONS AND ENVIRONMENT  
CENTRAL REGION ENVIRONMENTAL & GOVERNMENT AFFAIRS  
601 EAST 12<sup>TH</sup> STREET, SUITE 647  
KANSAS CITY, MO 64106-2896

January 28, 2008

Re: House Bill 2064

The Honorable Carl Holmes  
Kansas House of Representatives  
Kansas State Capitol  
300 SW 10th Street, Room 142-West  
Topeka, KS 66612

Dear Representative Holmes:

I am writing to you concerning the proposed legislation contained in House Bill 2064, which is currently before the Energy and Utilities Committee. As the Department of Defense, Regional Environmental Coordinator for Standard Federal Region VII, which includes the State of Kansas, I appreciate the opportunity to provide comments to this important legislation.

The Department of Defense supports the proposed legislation, conditioned upon the addition of the following amendment as a new subsection (d) to Sec. 3:

*(d) Rules and regulations developed per this Section shall not be used to restrict or otherwise regulate light emanating from any airfield or airport in the state.*

The potential negative impact of light pollution on training is why the Department of Defense is supporting this legislation. The Department of Defense consistently expresses our need to "train as we fight," emphasizing 24 hour operations and stressing that our fighting men and women must train in realistic, natural environments. Light trespass, glare, and increased night sky brightness impairs night vision training and reduces training effectiveness. While the military must be able to carry out their mission in remote locations where light pollution doesn't exist, light pollution throughout the Midwest has resulted in a night sky several times brighter than natural conditions. Providing natural nighttime training conditions helps our troops develop confidence in nighttime operations, improves overall operational capabilities, enhances nighttime combat effectiveness and ultimately minimizes casualties.

I welcome the opportunity to work with you and your committee on this and any future matter that may affect Defense installations and agencies in the state of Kansas. If you have any questions, please feel free to contact me at (816) 389-3445, or by e-mail at [stephen.c.scanlon@us.army.mil](mailto:stephen.c.scanlon@us.army.mil). I thank you for the opportunity to comment on H.B. 2064 and would appreciate it if you would share this letter with members of your committee.

Sincerely,

Stephen C. Scanlon

DoD Regional Environmental

HOUSE ENERGY AND UTILITIES

DATE: 1/30/2009

ATTACHMENT 2



DEPARTMENT OF HEALTH  
AND ENVIRONMENT

Kathleen Sebelius, Governor  
Roderick L. Bremby, Secretary

[www.kdheks.gov](http://www.kdheks.gov)

**Written Testimony on House Bill 2064**

**Submitted to the  
House Energy and Utilities Committee**

**By  
Rick Brunetti, Director  
Bureau of Air and Radiation**

**January 30, 2009**

Thank you, Chairman Holmes and members of the Committee, for allowing the Kansas Department of Health and Environment to provide written testimony on HB 2064. I am submitting this written testimony to address the topic of light pollution generally and HB 2064, the Night Sky Protection Act, specifically.

Artificial lighting doesn't necessarily produce light pollution, but excessive or intrusive lighting does. Well-designed lighting only places light where it is needed without scattering it elsewhere. Unshielded lighting may waste as much as 50%, shining it upward where it isn't needed. All of us in the Kansas are familiar with the "urban glow" that is apparent when we look toward any town or city from a rural area. Striking a balance between useful lighting and light pollution is the challenge of any lighting regulatory scheme.

In addition to the benefits of a darker sky to astronomers and stargazers, there are other reasons to address light pollution. For example, some animals are directly influenced by the darkness of the night sky, and there may be energy efficiency opportunities as well. Shielding outdoor lighting so as to limit its scatter doesn't save energy directly. However designing lighting so as to minimize waste light will have the secondary effect of using *less* light whenever possible - and therefore saving energy.

About a dozen other states have enacted statutes and resolutions regarding outdoor lighting. On the other hand, the number of local (city and county) ordinances that

CURTIS STATE OFFICE BUILDING, 1000 SW JACKSON ST., STE. 540, TOPEKA KS 66612-1368

Voice 785-296-0461 Fax 785-368-6368

*HOUSE ENERGY AND UTILITIES*

DATE: 1/30/2009

ATTACHMENT 3-1

have been enacted regarding light pollution are too many to count. This bill approaches the issue of light pollution from the broader perspective of the state. Specific lighting standards would effect more immediate reduction in light pollution, but are usually left to local jurisdictions to deal with in planning and zoning ordinances and building codes.

Section 3(a) requires the secretary of health and environment to adopt rules and regulations for voluntary guidelines to achieve reductions in night sky luminance over the next 45 years (resulting in darker skies over time). Section 3(b) of the bill requires secretary of health and environment to determine the natural nighttime sky luminance for each protected place based on environmental conditions.

An assessment of each "protected place" will be necessary to establish baseline conditions in order to compare progress over the next 45 years. At least 25 state parks, as well as the Cimarron National Grasslands, the Quivira National Wildlife Refuge, and the Tallgrass Prairie National Preserve would need to be assessed and subsequently monitored. The number of "designated military night training areas" is unknown at this time, but could include at least Fort Riley, Fort Leavenworth and McConnell Air Force Base.

Several different methods of assessment are available; both to establish a baseline and to measure progress. Research into assessment equipment, methods and techniques will be required. Simple measurements may be accomplished with the conversion of digital photographic images, but more sophisticated measurement of ambient light provides more reliable long-term monitoring.

The development of baseline data, drafting voluntary guidelines and regulations, and the subsequent monitoring of some 30 sites around Kansas will require a full-time professional position, as indicated by our fiscal note. The equipment needed is relatively inexpensive, but travel and labor will be significant. We estimate the fiscal impact to BAR to be \$79,722 per year.

Thank you for the opportunity to address this matter. Please let us know if you have any questions.

**Testimony before the House Energy and Utilities Committee  
Sub Committee  
January 30, 2009  
Opposing H.B. 2064**

Chairperson Holmes and Honorable Members of the Committee, my name is Tom Thompson and I represent the Kansas Chapter of the Sierra Club. I have come today to speak in opposition to H.B. 2064.

The Sierra Club believes that if enacted, 2064 could pose a threat to the development of wind energy in Kansas. Language in it is too vague. There are a number of questions that need to be answered. What are natural levels of light? How is Natural Nighttime sky determined? What sources of light are affected? How close to protected areas are of concern? What consideration is there for human safety?

It is felt that the author would have been better served by focusing on the lighting issues in urban areas where there is far more illumination.

The Sierra Club does not want an interruption of the natural activities of flora and fauna in Kansas. However, it is unclear what the purpose of this bill is or what it will accomplish.

The Sierra Club recommends that HB 2064 not be passed.

Sincerely

Tom Thompson  
Sierra Club