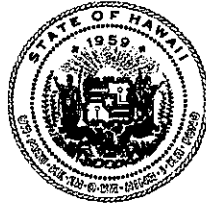
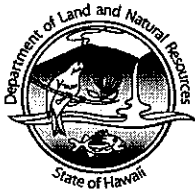


NEIL ABERCROMBIE  
GOVERNOR OF HAWAII



**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**  
POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

**WILLIAM J. AILA, JR.**  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

**GUY H. KAULUKUKUI**  
FIRST DEPUTY

**WILLIAM M. TAM**  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING

FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

**Testimony of**  
**WILLIAM J. AILA, JR.**  
**Chairperson**

**Before the House Committees on**  
**ENERGY & ENVIRONMENTAL PROTECTION**  
**and**  
**ECONOMIC REVITALIZATION & BUSINESS**

**Tuesday, March 20, 2012**  
**10:30 AM**  
**State Capitol, Conference Room 325**

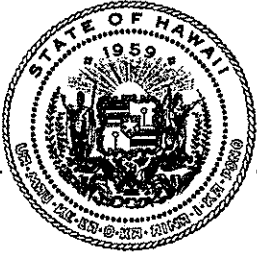
**In consideration of**  
**SENATE BILL 2402, SENATE DRAFT 1**  
**RELATING TO LIGHT POLLUTION**

Senate Bill 2402, Senate Draft 1 proposes to require that certain light sources be modified or replaced with fixtures that will limit and reduce sources of light pollution. The measure provides exemptions for public safety, lights that are temporary in nature, fixtures that emit less than 3,000 lumens, and any lights installed prior to July 1, 2013 and the Senate Draft 1 added a new exemption for historic properties. The measure would apply only to state agencies. The Department of Land and Natural Resources (Department) supports Senate Bill 2402, Senate Draft 1 as a welcomed first step in reducing sources of light pollution.

Light pollution in Hawaii impacts wildlife and increases consumption of fossil fuels that contribute to climate change. Lighting can disrupt breeding the breeding biology of endangered sea turtles and cause harm or death to seabirds, which can become disoriented and grounded by the lights. Once on the ground, the birds quickly fall prey to cats and other predators. On Kauai, for example, seabird fallout due to lights is a major threat contributing to the decline of the endangered Newell's Shearwater, a Hawaiian seabird whose population is now on a trajectory to extinction, having declined by approximately 75% in recent years.

Although light sources that impact wildlife and endangered species are not limited to those maintained by state agencies, this is a first step to reduce light pollution and may set the standard that other entities can follow as they move to deal with the issue and implement solutions.

The Department supports the measure, which will contribute to a reduction of light pollution in Hawaii, reduce emissions of greenhouse gasses, and enhance the survival of endangered sea turtles and seabirds.



**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

**NEIL ABERCROMBIE**  
GOVERNOR

**RICHARD C. LIM**  
DIRECTOR

**MARY ALICE EVANS**  
DEPUTY DIRECTOR

No. 1 Capitol District Building, 250 South Hotel Street, 5th Floor, Honolulu, Hawaii 96813  
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804  
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Telephone: (808) 586-2355  
Fax: (808) 586-2377

Statement of  
**RICHARD C. LIM**  
Director

Department of Business, Economic Development & Tourism  
before the

**HOUSE COMMITTEES ON  
ENERGY & ENVIRONMENTAL PROTECTION  
AND  
ECONOMIC REVITALIZATION & BUSINESS**

Tuesday, March 20, 2012

10:30 a.m.

State Capitol, Conference Room 325

in consideration of  
**SB 2402 SD1**

**RELATING TO LIGHT POLLUTION.**

Chairs Coffman and McKelvey, Vice Chairs Kawakami and Choy, and members of the Committees. The department supports the intent of SB 2402 SD1 to minimize glare and light pollution in Hawaii's night skies.

Our department convened a Starlight Reserve Committee in July of 2010 to study the impacts of nighttime light pollution statewide and provide recommendations for a Starlight Reserve Strategy that would address these issues. The chairman of this committee, Dr. Richard Wainscoat, is providing testimony today on this measure.

The department also appreciates that exclusions such as film production lighting are included to ensure this measure does not negatively impact Hawaii's film industry.

Thank you for the opportunity to testify on this bill.

NEIL ABERCROMBIE  
GOVERNOR



GLENN M. OKIMOTO  
DIRECTOR

Deputy Directors  
JADE T. BUTAY  
FORD N. FUCHIGAMI  
RANDY GRUNE  
JADINE URASAKI

IN REPLY REFER TO:

**STATE OF HAWAII**  
**DEPARTMENT OF TRANSPORTATION**  
869 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813-5097

March 20, 2012

**S.B. 2402, S.D. 1**  
**RELATING TO LIGHT POLLUTION**

HOUSE COMMITTEE(S) ON ENERGY & ENVIRONMENTAL PROTECTION  
and ECONOMIC REVITALIZATION & BUSINESS

The Department of Transportation supports this Senate Bill 2402, SD1 with comments.

The DOT has testified on similar bills last session expressing concerns that implementation of new and replacement outdoor light fixtures be fully shielded will require coordination with the scientific and environmental parties to properly address our lighting needs and to ensure that energy waste, light trespass, visual confusion, sky glow, etc. are considered so as not to adversely impact the need for dark night sky in areas such as astronomy or the protection of endangered species in Hawaii. These considerations to maintain and ensure transportation safety and security are necessary.

Thank you for the opportunity to provide testimony.



**NEIL ABERCROMBIE**  
GOVERNOR



**DEAN H. SEKI**  
ACTING COMPTROLLER  
**JAN S. GOUVEIA**  
DEPUTY COMPTROLLER

**STATE OF HAWAII**  
**DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES**  
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

WRITTEN TESTIMONY  
OF  
DEAN H. SEKI, ACTING COMPTROLLER  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
TO THE  
HOUSE COMMITTEES  
ON  
ENERGY & ENVIRONMENTAL PROTECTION AND ECONOMIC REVITALIZATION &  
BUSINESS  
ON  
March 20, 2012  
S.B. 2402, S.D. 1

RELATING TO LIGHT POLLUTION

Chairs Coffman, McKelvey and members of the Committees, thank you for the opportunity to submit written testimony on S.B. 2402, S.D. 1.

The Department of Accounting and General Services supports S.B. 2402, S.D. 1, as it contributes to advancing the lighting industry to further energy efficient exterior lighting products that sensibly prevent excess light from reaching the night sky.

Thank you for the opportunity to submit written testimony on this matter.



# UNIVERSITY OF HAWAII SYSTEM

## Legislative Testimony

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Written Testimony Presented Before the  
House Committees on Energy and Environmental Protection and  
Economic Revitalization and Business  
Tuesday, March 20, 2012 at 10:30 a.m.

by

Virginia S. Hinshaw, Chancellor

and

Richard J. Wainscoat

Astronomer, University of Hawai'i at Mānoa  
Chair, Light Pollution Working Group, International Astronomical Union

SB 2402 SD1 Relating to Light Pollution

Chairs Coffman and McKelvey, and members of the Committees. My name is Richard Wainscoat and I am here today to submit this testimony on behalf of the University of Hawai'i. The University of Hawai'i strongly supports this bill that is an important first step in reducing light pollution in Hawaii.

Mauna Kea on the island of Hawai'i, and Haleakala on the island of Maui, are two of the best astronomy sites in the world. Dark night skies are essential for these observatories to continue to operate. However, increasing urban lighting is threatening the dark night skies over these observatories. Light pollution extends well beyond county boundaries; lights from O'ahu have a major and growing impact on Haleakala, and also affect Mauna Kea. Statewide legislation is needed to protect the observatories.

Astronomy in Hawai'i has a major economic impact. The present economic impact of astronomy is estimated to be \$150 to \$200 million per year.

The primary focus of this bill is proper shielding of outdoor lighting. Full shielding of lights is one of the most important techniques for protecting astronomical observatories from light pollution. Light emitted from poorly shielded fixtures at small angles above the horizontal travels enormous distances through the atmosphere, and is a major contributor to light pollution — it increases sky glow at remote locations, making it difficult or impossible to see faint objects. Fully shielded light fixtures emit no light above the horizontal, and therefore have much less impact on remote locations.

Full shielding also reduces glare, which is a very important safety factor, particularly for older drivers, and greatly reduces the impact of nighttime lighting on species that are affected by light at night, including endangered birds and turtles. Poorly designed and improperly shielded lights continue to be installed by government agencies, and a quick inventory of nighttime lighting shows that some of the most poorly shielded lighting is county and state lighting.

We note that SB 2402 SD1 affects only lighting by the state and state agencies. Careful use of all nighttime lighting in the state of Hawai'i — not just state lighting — including proper shielding, is required to protect the observatories.

We have provided suggested changes to the wording of the bill for clarification purposes. The suggested changes do not affect the intent of the bill.

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# A BILL FOR AN ACT

RELATING TO LIGHT POLLUTION.

**BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:**

SECTION 1. The legislature finds that the night sky is a tremendously valuable natural and cultural resource for the residents of Hawaii, and for visitors to Hawaii. The dark night sky has tremendous scientific value for astronomy, and is vitally important for wildlife in Hawaii including birds and turtles. Mauna Kea, on the island of Hawaii, is the best astronomical observatory site in the northern hemisphere, and arguably the best site on Earth. Haleakala on the island of Maui is also a world-class astronomical observatory site.

Unnecessary light pollution is threatening the dark night sky over the Hawaiian Islands. This light pollution includes sky glow, energy waste, glare, light trespass, visual confusion, and environmental harm. Light can travel enormous distances through the Earth's atmosphere, and therefore does not respect county boundaries. Light pollution spreads across the entire State and must be addressed using statewide

legislation. Furthermore, endangered species that are affected by light at night live on many of the Hawaiian Islands.

Many of the problems with light pollution that Hawaii faces are caused by improperly shielded lights. Poorly shielded lights direct energy straight into the atmosphere, where it is wasted. This light produces sky glow, which limits residents' ability to see stars. For example, in Honolulu only about the brightest twenty stars are visible, whereas about two thousand stars can be seen from a dark location. Poorly shielded lights also cause glare, which diminishes a person's ability to see at night. Poorly shielded lights also enter locations where the light is unwanted (light trespass), including bedrooms, making it difficult for residents to sleep. Excessive light in the sleeping environment has recently been linked to an increased incidence of breast cancer. Improperly shielded lights on the island of Kauai have led to many bird deaths, particularly of the endangered Newell's shearwater.

Act 161, Session Laws of Hawaii 2009, formed a temporary advisory committee to assist the department of business, economic development, and tourism to develop a statewide starlight reserve strategy to preserve the quality of the night sky and its associated cultural, scientific, astronomical, natural, and landscape-related values. The temporary advisory committee recommended the enactment of certain measures in the

2012 regular session to conserve energy and promote responsible use of light.

The purpose of this Act (hereinafter to also be known as the Hawaii Night Sky Protection Act) is to implement the recommended legislation of the temporary advisory committee established pursuant to Act 161. It is not the intent of this Act to require the realignment or relocation of any existing light poles.

SECTION 2. Chapter 201, Hawaii Revised Statutes, is amended by adding a new section to be appropriately designated and to read as follows:

"§201- **Night sky protection strategy.** (a) Beginning July 1, 2013, all state agencies shall comply with shielded lighting fixture requirements under this section, whereby, **except as specified otherwise in sections (c) through (f)**, every new outdoor lamp light fixture emitting more than three thousand lumens shall be required to be fully shielded and to have a correlated color temperature of thirty-eight hundred Kelvin or less; provided that the impact of artificial light on shoreline and ocean waters shall be subject to compliance with section 205A-71. A lighting fixture is considered to be fully shielded when the lighting fixture is shielded in such a manner that all light rays emitted by the fixture, either directly from the lamp, or indirectly from the fixture, are projected below a



horizontal plane running through the lowest point of the fixture.

(b) No new mercury vapor lamps shall be sold or installed after July 1, 2013.

(c) As applicable, retrofit work or replacement of existing lighting fixtures shall:

(1) Limit the rated correlated color temperature of emitted light (lamp, fixture, and filter if used) to less than or equal to thirty-eight hundred Kelvin, **except in the case of outdoor athletic facilities as described in section (d);**

(2) Not be **subject to the shielding requirement** for lamp-by-lamp replacement work; and

(3) Require one hundred per cent fully shielded lighting fixtures be installed if more than fifty per cent of existing nonconforming lighting fixtures need to be replaced.

(d) **For outdoor athletic facilities, fully shielded lighting fixtures with correlated color temperatures less than or equal to 3,800 Kelvin are preferred, but not required.** Where fully shielded lighting fixtures are not used, acceptable luminaries shall include light fixtures that are:

(1) Equipped with internal, external, or internal and external glare control louvers and are installed so as

to limit direct up-light to less than five per cent of the total lumens exiting from the installed fixtures and minimize offsite light trespass; and

- (2) Installed and maintained with minimum aiming angles of twenty-five degrees downward from the horizontal; provided that the aiming angle shall be measured from the axis of the luminaire maximum beam candlepower, as certified by an independent testing agency.

(e) Fully shielded replacement lighting fixtures for state managed roadways and highways shall be installed on a case-by-case basis, subject to the availability of capital improvement project funding and compliance with applicable federal, state, or county design standards or guidelines. Where fully shielded fixtures are not used, acceptable luminaires shall be partially shielded lights that emit no more than five per cent of their light above the horizontal plane, as certified by an independent testing agency.

(f) The use of existing nonconforming lighting fixtures shall be allowed, subject to compliance with subsection (c) (3), for:

- (1) Lighting fixtures that are extinguished between the hours of 11:00 p.m. and sunrise by an automatic shutoff device; or

(2) Outdoor amphitheaters, ballparks, playfields, play courts, or other similar recreational facilities, whether public or private, that are used for international, national, state, or county tournaments; or as needed to conclude any recreational event, sporting event, or other related clean up activity that is in progress prior to 11:00 p.m. at the amphitheater, ballpark, playfield, play court, or similar recreational facility.

(g) The following light sources shall be exempt from this section:

- (1) Lighting sources emitting three thousand lumens or less, which is comparable to a lighting fixture with an incandescent lamp rated at one hundred fifty watts or less, and temporary ornamental holiday lights;
- (2) Emergency lighting used by military, national guard, police, firefighters, correctional, medical, or hazardous material mitigation personnel or other emergency responders for the duration of the emergency;
- (3) Temporary outdoor lighting used for construction or major renovation of buildings or for highway improvements or construction;

- (4) Temporary outdoor lighting used for night-time film production and other night-time permitted activities such as carnivals and concerts;
- (5) Temporary outdoor lighting used for night-time agricultural operations;
- (6) Navigational lights that are required for waterway, open ocean, and aircraft safety;
- (7) Existing outdoor lighting fixtures that were legally installed prior to July 1, 2013, **subject to compliance with subsection (c) (3);**
- (8) Outdoor lighting fixtures that are necessary for compliance with applicable federal, state, or county design standards or guidelines that are related to health and safety for the general public;
- (9) Upwards facing lighting fixtures used to illuminate buildings, monuments, statues, memorial structures, national or state flags, and other selected facilities or features that were legally installed prior to July 1, 2013, or that will result in the generation of three thousand lumens or less, as certified by an independent testing agency; and
- (10) Refurbishment, repair, or replacement-in-kind of lighting fixtures that are character-defining features of a historic property, as determined by the

department of land and natural resources historic  
preservation division.

(h) This section shall be considered to be supplemental to  
any adopted county lighting ordinances and shall not be  
construed to supersede or modify county lighting ordinances or  
rules; provided that the county ordinance is not less  
restrictive than this section."

SECTION 3. This Act does not affect rights and duties that  
matured, penalties that were incurred, and proceedings that were  
begun before its effective date.

SECTION 4. New statutory material is underscored.

SECTION 5. This Act shall take effect on July 1, 2012.

**Report Title:**

Outdoor Lighting; Starlight Reserve

**Description:**

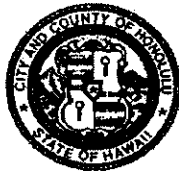
Requires every new and replacement outdoor light fixture to be fully shielded beginning 7/1/13, with certain exemptions. (SD1)

*The summary description of legislation appearing on this page is for informational purposes only and is not legislation or evidence of legislative intent.*

**DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 11<sup>TH</sup> FLOOR  
HONOLULU, HAWAII 96813  
Phone: (808) 768-8480 • Fax: (808) 768-4567  
Web site: [www.honolulu.gov](http://www.honolulu.gov)

PETER B. CARLISLE  
MAYOR



LORI M.K. KAHIKINA, P.E.  
DIRECTOR

CHRIS TAKASHIGE, P.E.  
DEPUTY DIRECTOR

March 19, 2012

The Honorable Denny Coffman, Chair  
and Members  
House Committee on Energy and Environmental Protection  
State Capitol  
Honolulu, Hawaii 96813

The Honorable Angus L.K. McKelvey, Chair  
and Members  
House Committee on Economic Revitalization and Business  
State Capitol  
Honolulu, Hawaii 96813

Dear Chair Coffman, Chair McKelvey, and Members:

Subject: Senate Bill No. 2402, Relating to Light Pollution

The bill proposes, among other requirements, that "Beginning July 1, 2013, all state agencies shall comply with shielded lighting fixture requirements under this section, whereby every new outdoor lamp light fixture emitting more than three thousand lumens shall be required to be fully shielded and to have a correlated color temperature of thirty-eight hundred Kelvin or less..."

The Department of Design and Construction (DDC) respectfully agrees with the intent of Senate Bill 2402 to reduce light pollution, but has some concerns regarding the practicality of the bill's requirements, and provides the following comments for your consideration.

1. The bill would adversely affect projects currently in the design or early construction phase for which installation of outdoor lighting meeting the criteria proposed for regulation is scheduled for installation after July 1, 2013, at which time the bill's requirements would become effective. Consideration should be given to designating the effective date of the bill's requirements to July 1, 2014 or later, to avoid the significant additional cost and delay of redesigning projects prior to installation of exterior lighting in order to comply with the bill's new requirements, should the bill be enacted.

The Honorable Denny Coffman, Chair  
and Members  
The Honorable Angus L.K. McKelvey, Chair  
and Members  
March 19, 2012  
Page 2

2. The applicability of proposed Hawaii Revised Statutes Section 201-\_\_ (f) is unclear, specifically the reference, "...subject to compliance with subsection (c) (3)..." It is unclear whether new lighting fixtures extinguished between 11:00 p.m. and sunrise by an automatic shutoff device or lighting for a new ballpark or playfield would be allowed to use nonconforming fixtures, or whether these exceptions apply only to existing facilities replacing fewer than 50% of the existing fixtures. This language should be revised to more clearly express the intended meaning.

Thank you for the opportunity to testify.

Very truly yours,

  
Lori M. K. Kahikina, P.E.  
Director

LKWB :lm



**Testimony Related to**

**Senate Bill 2402 SD1**

**RELATING TO LIGHT POLLUTION**

**Presented before the**

**House Committee on Energy and Environmental Protection  
and  
House Committee on Economic Revitalization and Business**

**March 20, 2012**

**by**

**Richard J. Wainscoat**

**Chair, Starlight Reserve Committee**

Chairs Coffman and McKelvey and members of the Committees. My name is Richard Wainscoat and I am submitting this testimony in my capacity as Chair of the Starlight Reserve Committee.

The Starlight Reserve Committee was established by the 2009 state legislature. It held its first meeting in July 2010, and during 2011 met on a regular basis. One of the tasks of the Committee is to develop proposed legislation for statewide intelligent lighting laws that reduce light pollution. This bill contains language recommended by the committee related to proper shielding of outdoor lights in Hawaii.

The bill contains numerous exemptions aimed at reducing or eliminating any possible additional cost by using properly shielded lights. These include:

1. Existing legally installed lights are exempt — only new and replacement lights are affected;
2. Full shielding is required only for bright light sources (brighter than 3,000 lumens) — this means that most residential lighting is exempt; and
3. Numerous other exemptions such as emergency lighting, temporary lighting, and navigational lighting.

Full shielding of lights has the following important advantages:

1. Light sources are not visible from above, meaning that the impact on endangered birds that are attracted to lights at night, such as the Newell's shearwater, is much reduced.
2. Fully shielded lights emit little light near the horizontal, so the impact on endangered turtles that become disoriented by lights on beaches is much reduced.

**Testimony Related to Senate Bill 2402 SD1**  
**House Committee on Energy and Environmental Protection**  
**House Committee on Economic Revitalization and Business**  
**March 20, 2012**  
**Page 2**

3. Fully shielded lights cause much less glare than partially shielded lights, improving safety, including on our roadways. It is particularly important to avoid glare for elderly drivers, who may have degraded vision due to cataracts or other reasons.
4. Fully shielded lights cause much less skyglow, dramatically reducing the impact of artificial lighting on Hawaii's astronomical observatories. Light emitted at small angles above the horizontal travels enormous distances through Earth's atmosphere. It does not respect county boundaries. Light from Honolulu affects both Haleakala and Mauna Kea Observatories. Use of fully shielded light fixtures is the most important technique for protecting astronomy in Hawaii.
5. Partially shielded lights emit some of their energy directly into space where it is wasted. Fully shielded lights direct their energy downwards only, where it is needed, and can therefore save energy. Substantial energy savings of up to 40% are possible by use of carefully shielded lights.
6. Fully shielded lights emit much less light at near horizontal angles, meaning that light trespass is substantially reduced. Light from adjacent properties or from streetlights entering our bedrooms is a form of light trespass. It can make it difficult to sleep at night. Excessive light at night has been linked to some forms of cancer, particularly breast cancer.
7. Use of fully shielded lights across Hawaii will result in a substantial decrease in skyglow, and restore the ability of Hawaii's residents and visitors to see the night sky. The Milky Way is no longer visible from urban Honolulu. Only about the brightest 20 stars are visible from urban Honolulu. About 2,000 stars can be seen from a dark location. The dark night sky on the island of Hawaii is slowly becoming a tourist attraction — many of Hawaii's visitors come from urban locations that have severe light pollution, and are amazed by the view of the dark night sky from the island of Hawaii. Sadly, many of our children are growing up without ever seeing the magnificent night sky. This is unnecessary, and is a direct result of irresponsible and careless use of light at night.

The Starlight Reserve Committee has not yet discussed the exemption for historic lighting inserted by the Economic Development and Technology and the Energy and Environment Committees in SD1. I note that historical lighting typically predates the invention of the high intensity discharge lamp, and is normally designed for use with light sources significantly dimmer than 3,000 lumens (the limit already included in this bill for the requirement of full shielding).

**kawakami1 - Marissa**

---

**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Friday, March 16, 2012 3:26 PM  
**To:** EEPtestimony  
**Cc:** bill@ejlounge.com  
**Subject:** Testimony for SB2402 on 3/20/2012 10:30:00 AM

Testimony for EEP/ERB 3/20/2012 10:30:00 AM SB2402

Conference room: 325  
Testifier position: Comments Only  
Testifier will be present: No  
Submitted by: William Comerford  
Organization: Individual  
E-mail: [bill@ejlounge.com](mailto:bill@ejlounge.com)  
Submitted on: 3/16/2012

Comments:

Dear Committee Members

I do not oppose this for state facilities but would be opposed to this on a commercial basis.

The arguments for this are understood but no mention of expense seems to be apparent.

I do have one very important question to ask in all this discussion and testimony I see no estimate of cost to do this statewide and at all state facilities. What is the projected cost to do this annually and over the length of the conversions? If it is prohibitive I think it should be deferred until more pressing economic issues are resolved.

Sincerely,

Bill Comerford

I, Wailana Kamauu, Jr., support Senate Bill 2402 with comments.

As a business owner working with various US based lighting manufacturers such as Ruud Lighting, Cree, Philips, GE, and others, I agree with the need to manage light pollution and protect our endangered species. Also, I believe SB2402 needs to ensure that transportation safety and security along our highways and streets are not compromised.

On June 15, 2011, The International Dark-Sky Association (IDA) and the Illuminating Engineering Society (IES) published a document entitled "Model Lighting Ordinance" (MLO) to help municipalities structure outdoor lighting ordinances that would meet the concerns of the astronomy community and allow the lighting engineers to focus on safety and security. This is an excellent platform to build an ordinance and based on my reading of SB2402, many of the MLO measurements have been used. Controlling Backlight, Upright, and Glare (BUG rating) are important to protecting our night sky. Also by implementing the correct lighting control measures, highway safety and security will not be compromised. Those aspects of the Bill I agree with and support.

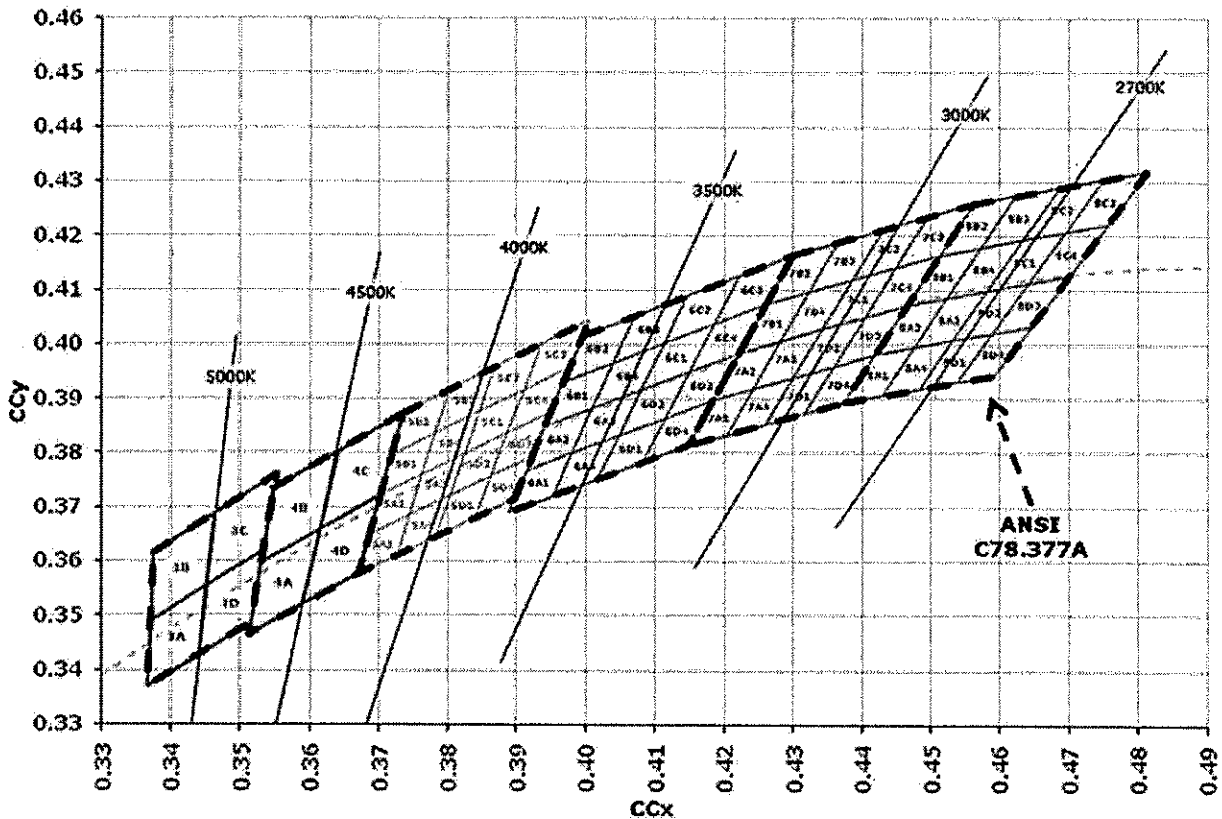
The issue I have is limiting the light source to "3800 Kelvin" because it is a non-standard color temperature. Lighting manufacturers produce lighting products in certain ranges called "Bins". In fact, 3800K is part of the 4000K bin. But if the limit is placed at the lower color of 3800K it would force the vendor to provide a lower bin, which would be 3500K. Therefore, the color temperature for SB2402 should be 4000K, which is a standard color temperature, instead of 3800K. The cost to manufacture an exact 3800K streetlight because it is non-standard may cost Hawaii an unnecessary expense. Also, using 4000K and the light controlling measures indentified in SB2402 will satisfy the concerns of the astronomers and meet the need to maintain safety and security along our streets and highways. Please consider changing 3800 Kelvin to the standard 4000 Kelvin.

Mahalo

H. Wailana Kamauu, Jr.  
President/CEO  
American LED and Energy Corporation

To whom it may concern,

Regarding the language in the bill that limits LED source Correlated Color Temperature to 3800 Kelvin (K), please consider the following and reference the attached images. Both images contain reference to the ANSI C78.377 Specifications for the Chromaticity of Solid State Lighting Products. The nominal Correlated Color Temperature (CCT) bins are clearly identified. For example, the 4000 Kelvin (K) bin which is bound by the 4500K and 3500K bins. Although a specific "bin" for 3800K is not identified, a source that measures 3800K CCT would actually fall into the 4000K ANSI bin. More specifically, the source would most likely be "sub-binned" (note: there are 16 sub-bins per bin in most cases) as one of the four sub-bins at the edge of the 4000K/3500K boundary line. We strongly recommend that the language amended to reflect a change from 3800K to 4000K.



# ANSI C78.377 Specifications for the Chromaticity of SSL products

Published Feb. 2008

ANSI Z39.18, CANADA C78.377-0008

**American National Standard**

Approved January 1, 2008      Secretariat: American National Standards Institute

for electric lamps

**Specifications for the Chromaticity of Solid State Lighting Products**

**Foreword** (This foreword is not part of American National Standard C78.377-2008.)

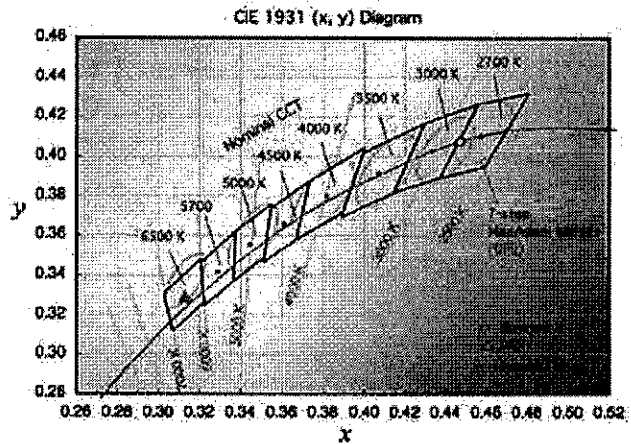
This is a new standard recently developed by the industry.

Suggestions for improvement of this standard should be submitted to the Secretary, American National Standard Lighting Group, 1304 North 17<sup>th</sup> Street, Suite 1752, Reston, VA 22099.

This standard was processed and approved by the Accredited Standards Committee on Electric Lamps, C78, and the National Electrical Manufacturers Association (NEMA) Lighting Section. Technical work group functions as the body on the topic. Standard Committee approval of the standard does not necessarily imply that all committee members voted for that approval.

Amendments/Change	1208	85
Revisions	076, 2208	C78.377-11

**Directors:** NEMA, Chair; ASCE, Secretary  
 Yusef Ghoni, Technical Coordinator  
 Randolph N. Ray, ASCE, Secretary  
 Matt Clark, NEMA, Editor



- For indoor applications only
- No standards for outdoor applications

Optical Technology Division

NIST 15

Thank you for your consideration,

Eric Haugaard

Director of Product Technology

Cree Lighting

**kawakami1 - Marissa**

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**From:** mailinglist@capitol.hawaii.gov  
**Sent:** Saturday, March 17, 2012 10:32 AM  
**To:** EEPtestimony  
**Cc:** babyjean@hotmail.com  
**Subject:** Testimony for SB2402 on 3/20/2012 10:30:00 AM

Testimony for EEP/ERB 3/20/2012 10:30:00 AM SB2402

Conference room: 325  
Testifier position: Support  
Testifier will be present: No  
Submitted by: Ronnie Perry  
Organization: Individual  
E-mail: [babyjean@hotmail.com](mailto:babyjean@hotmail.com)  
Submitted on: 3/17/2012

**Comments:**

Please pass this bill. We desperately need light pollution control on the island of Oahu.