NEIL ABERCROMBIE
GOVERNOR

DEAN H. SEKI
ACTING COMPTROLLER

JAN S. GOUVEIA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

WRITTEN TESTIMONY
OF
DEAN H. SEKI, ACTING COMPTROLLER
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
TO THE
HOUSE COMMITTEE
ON
FINANCE
ON
March 29, 2012

S.B. 2402, S.D. 1, H.D. 1

RELATING TO LIGHT POLLUTION

Chair Oshiro and members of the Committee, thank you for the opportunity to submit written testimony on S.B. 2402, S.D. 1, H.D. 1.

The Department of Accounting and General Services supports S.B. 2402, S.D. 1, H.D. 1, as it promotes energy efficient exterior lighting products that sensibly prevents excess light from reaching the night sky.

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

NEIL ABERCROMBIE
GOVERNOR

RICHARD C. LIM
DIRECTOR

MARY ALICE EVANS
DEPUTY DIRECTOR

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

No. 1 Capitol District Building, 250 South Hotel Street, 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804
Web site: www.hawaii.gov/dbedt

Telephone: (808) 586-2355
Fax: (808) 586-2377

Statement of
RICHARD C. LIM
Director

Department of Business, Economic Development & Tourism
before the

HOUSE COMMITTEE ON FINANCE

Thursday, March 29, 2012
3:00 p.m.
State Capitol, Conference Room 308

in consideration of
SB 2402 SD1 HD1

RELATING TO LIGHT POLLUTION.

Chair Oshiro, Vice Chair Lee, and members of the Committee. The department supports the intent of SB 2402 SD1 HD1 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 OF HAWAII

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

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

Testimony of
WILLIAM J. AILA, JR.
Chairperson

Before the House Committee on
FINANCE

Thursday, March 29, 2012
3:00 PM
State Capitol, Conference Room 308

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

Senate Bill 2402, Senate Draft 1, House 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, 2014. The measure would apply only to state agencies. The Department of Land and Natural Resources (Department) supports Senate Bill 2402, Senate Draft 1, House 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.

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 29, 2012

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

HOUSE COMMITTEE ON FINANCE

The Department of Transportation supports this Senate Bill 2402, SD1, HD1 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.

UNIVERSITY OF HAWAI'I SYSTEM
Legislative Testimony

Written Testimony Presented Before the
House Committee on Finance
Thursday, March 29, 2012 at 3:00 p.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 HD1 Relating to Light Pollution

Chair Oshiro, and members of the Committee. 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 Hawai'i.

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 HD1 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 recommend that some of the changes introduced in HD1 be reversed. Specifically:

1. The exclusion for counties with populations under 100,000 (i.e., Kauai) is unwise. Kauai has endangered birds that are strongly affected by poor nighttime lighting. Poor lighting on Kauai has resulted in criminal prosecutions under the Federal Endangered Species Act. SB 2402 codifies good lighting practices, will minimize impact on birds, and therefore will help to protect the State from possible future expense in retrofitting or replacing poorly designed lighting that might otherwise be installed.
2. The change of effective date to July 1, 2014 (section 5) appears to have been an error. We recommend restoring the original effective date for this act to July 1, 2012.
3. SD1 made the changes become effective beginning on July 1, 2013. The delay by one year to July 1, 2014 produces an unnecessary delay in halting further damage to astronomy and the environment caused by poorly designed lighting. The state agencies that participated in the Starlight Reserve Committee were comfortable with July 1, 2013, and we recommend restoring July 1, 2013 as the date on which the changes are required (Sections 2(a), 2(b), 2(g)(7), 2(g)(9)).
4. The change of maximum Correlated Color Temperature to 4,000 Kelvin will result in additional blue light that is harmful to both astronomy and to endangered species. We recommend restoring the maximum Correlated Color Temperature to a value of 3,800 Kelvin. This number is a compromise between the value of 3,500 Kelvin utilized in Pima County (Arizona), which was specifically chosen to protect astronomy, and a need to accommodate a slightly higher value for filtered LEDs that have no blue light, such as those already being used on the island of Hawai'i.

HISTORIC HAWAI'I FOUNDATION

To: Rep. Marcus R. Oshiro, Chair
Rep. Marilyn B. Lee, Vice Chair
Committee on Finance

From: Kiersten Faulkner
Executive Director, Historic Hawai'i Foundation

Committee Date: Thursday, March 29, 2012
3:00 p.m.
Conference Room 308

Subject: **SB 2402 SD1 HD1, Relating to Light Pollution**

On behalf of Historic Hawai'i Foundation (HHF), I am writing in support of SB 2402 SD1 HD1, Relating to Light Pollution. The bill would develop standards for outdoor lighting to reduce light pollution by requiring every new and replacement outdoor light fixture to be fully shielded, with certain exemptions.

Since 1974, Historic Hawai'i Foundation has been a statewide leader for historic preservation. HHF's 850 members and numerous additional supporters work to preserve Hawaii's unique architectural and cultural heritage and believe that historic preservation is an important element in the present and future quality of life, economic viability and environmental sustainability of the state.

HHF finds the proposed measure is an important step in safeguarding the night sky and Hawaii's wildlife. We note that the starry sky, indigenous birds, turtles and other wildlife and natural resources are important cultural as well as natural resources and HHF support efforts to preserve and protect them through reasonable restrictions on outdoor lighting design, location, intensity and direction.

We also note with appreciation the limited exemption for 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. In most cases, outdoor lighting that is associated with historic buildings or sites should be able to comply with the proposed standards. However, in some circumstances, historic properties may include historic lighting fixtures or design features that are important character-defining elements that are significant to the historic integrity of the property. In these cases, the Secretary of the Interior's Standards for the Treatment of Historic Properties directs that, "distinctive materials, features, finishes…that characterize a property will be preserved," and "deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials" (emphasis added).

Therefore, HHF supports SB 2402 SD1 HD1 as it includes an limited exemption for certain types of lighting associated with historic properties.

Historic Hawai'i Foundation

680 Iwilei Road, Suite 690 • Honolulu, HI 96817 • Tel: 808-523-2900 • FAX: 808-523-0800 • www.historichawaii.org

Testimony Related to

Senate Bill 2402 SD1 HD1

RELATING TO LIGHT POLLUTION

Presented before the

House Committee on Finance

March 29, 2012

by

Richard J. Wainscoat

Chair, Starlight Reserve Committee

Chair Oshiro and members of the Committee. 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.
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 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).

I note that some of the changes introduced in HD1 conflict with discussions by the Starlight Reserve Committee. In particular:

1. All state agencies represented in the Starlight Reserve Committee meetings were comfortable with the changes required by this bill becoming effective July 1, 2013 (Sections 2(a), 2(b), 2(g)(7), 2(g)(9)). The delay to July 1, 2014 appears to be unnecessary and may result in additional harm to the environment and astronomy by delaying the introduction of better lighting practices.
2. The Starlight Reserve Committee explicitly discussed the appropriate maximum correlated color temperature (CCT). Use of a correlated color temperature cap is a technique to control the amount of blue light that is particularly harmful to both astronomy and the environment. The committee noted the Pima County, Arizona, upper limit of 3,500 Kelvin that was chosen to protect astronomy. The committee also noted

that LED lights currently in use on the island of Hawaii that use a filter to remove the blue light, have a CCT slightly higher than 3,500 Kelvin. The committee therefore recommended a CCT cap of 3,800 Kelvin to accommodate use of filtered LEDs, but to eliminate use of lights with CCT of 4,000 Kelvin and above, which were judged to have excessive amounts of blue light.

3. The Starlight Reserve Committee had extensive discussions of the problems with endangered birds on Kauai and nighttime lighting. The committee did **not** recommend excluding Kauai from SB 2402. Instead, it is important that Kauai be included in the areas that are affected by SB 2402, because the lighting practices that SB 2402 will mandate are the same lighting practices that are required to reduce impact on the endangered birds.

Finally, I note that the change in effective date for this act to July 1, 2014 (Section 5) appears to have been an error, and recommend that the original date of July 1, 2012 be restored.