

LATE TESTIMONY

Testimony Related to

Senate Bill 165

RELATING TO AEROSPACE DEVELOPMENT

Presented before the

Senate Committee on Public Safety, Government Operations and Military Affairs

and the

Senate Committee on Economic Development

The Twenty-Sixth Legislature

February 10, 2011

by

Richard J. Wainscoat

Chair

Starlight Reserve Committee

Chairs Espero and Fukunaga, and members of the Committees. My name is Richard Wainscoat and I am here today to submit this testimony in my capacity as Chair of the Hawaii Starlight Reserve Committee. I strongly support the section of this bill that will extend the duration of the Starlight Reserve Committee.

The Starlight Reserve Committee was established by the 2009 legislature. The previous administration delayed the formation of the committee by approximately one year due to budgetary concerns. The committee held its first meeting in July 2010, and has met on four occasions. The committee received extensive input from many stakeholders, and has already concluded that full shielding of bright outdoor light sources is an important first step in saving energy and protecting Hawaii's environment, including endangered species, the dark night sky, and astronomy.

Act 161 asked the Starlight Reserve Committee to assist DBEDT to develop legislation to implement a statewide intelligent lighting and light pollution law that takes into consideration the following:

1. Develop rules regulating the requirements of outdoor lighting to guarantee the protection of night sky quality;
2. Incorporate measures to conserve energy and promote responsible outdoor night lighting;

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3. Develop standards for intelligent lighting design in architecture, urban planning, engineering, and infrastructure development;
4. Strengthen statewide commitment to preserving the night sky by adopting intelligent lighting in the public sector;
5. Promote labeling to recognize intelligent lighting fixtures and products;
6. Develop alliances with both public and private entities primarily responsible for outdoor night lighting;
7. Develop measures to avoid obtrusive light and improve the quality of life of local populations; and
8. Educate local residents about existing solutions, as well as the environmental, personal, and energy-savings benefits that intelligent lighting entails.

It is clear that the Starlight Reserve Committee still has much work to do. The committee discussed the amount of time that it felt was needed to accomplish these tasks, and believes that an extension by 2 years to June 30, 2013 is appropriate.

Report to Hawaii State Legislature from the Starlight Reserve Committee

submitted by

Richard Wainscoat (Chair)

The Starlight Reserve Committee (SRC) was established by Act 161 of the 2009 State Legislature. Actions by the Governor delayed the establishment of the committee until mid 2010. The committee has met three times, on July 13, 2010, September 27, 2010, and November 30, 2010. The membership of the committee is detailed on a separate document (attached). David Shimokawa has replaced Susan Papuga as the representative of the State Department of Transportation. Despite numerous attempts, we were unable to find an engineer in Hawaii who was willing to serve on the committee. A lighting engineer from Arizona was therefore selected (Chris Monrad); his company is licensed in Hawaii.

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2. Incorporate measures to conserve energy and promote responsible outdoor night lighting;
3. Develop standards for intelligent lighting design in architecture, urban planning, engineering, and infrastructure development;
4. Strengthen statewide commitment to preserving the night sky by adopting intelligent lighting in the public sector;
5. Promote labeling to recognize intelligent lighting fixtures and products;
6. Develop alliances with both public and private entities primarily responsible for outdoor night lighting;
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8. Educate local residents about existing solutions, as well as the environmental, personal, and energy-savings benefits that intelligent lighting entails.

The SRC studied existing state and county lighting legislation. The Counties of Hawaii and Maui both have lighting ordinances that have been established to protect the observatories on those islands. Despite not having a lighting ordinance, the County of Kauai has some of the best lighting in the state of Hawaii, because of efforts to protect endangered native birds. All streetlights on the island of Kauai are fully shielded, meaning that they emit no light directly upwards.

During the first three meetings of the SRC, stakeholders, including those on the committee and invited guests presented their perspectives on nighttime lighting. Guest presentations were invited from the military, law enforcement, the US Fish and Wildlife Service, Hawaii Division of Forestry and Wildlife, NOAA fisheries, visitor industry, private development, utility companies, and the National Park Service. Despite repeated invitations, no representatives of law enforcement or the visitor industry participated in the meetings.

The SRC discussed in detail the situation on Kauai where criminal prosecutions and other legal actions have been taken related to outdoor lighting and endangered birds. The committee was informed of some of the corrective actions being taken by the County of Kauai to replace unshielded lighting at its stadiums with fully shielded lighting. It is hoped that properly shielded lights will not attract endangered birds. The committee was also informed of the cultural value to the people of Kauai of the nighttime football games.

The representatives of the US Fish and Wildlife Service (USFWS) informed the committee that the problems with endangered species and nighttime lighting were not restricted to the island of Kauai, and that they were looking to the SRC to establish statewide legislation to improve nighttime lighting across the entire state. Without such action, further criminal prosecutions related to endangered species and improper lighting may occur on all islands.

A very common theme that emerged from much of the discussion at the SRC is that outdoor lighting should be fully shielded. A fully shielded light emits no light directly above the horizontal plane. Fully shielded lights are favorable to astronomy — the only light that goes into the night sky is reflected from the ground. They are much more favorable for birds, because the light source cannot be seen from above. They are also more favorable for endangered sea turtles, because the shielding means that little or no light falls onto the beach (lights can disorient mother turtles and hatchlings). Fully shielded lights also can save energy, because they do not waste energy by shining light directly into the sky where it has no value. Fully shielded lights also reduce light trespass. Each county along with the state department of transportation is already switching to fully shielded lights in all new lighting.

In early 2011, a scientific paper was published that linked, for the first time, excessive light in bedrooms at night with breast cancer. A link between shift work and breast cancer has long been established, and is now recognized by the World Health Organization. Light, particularly blue light, has been shown to reduce melatonin production. Reduced melatonin levels have been shown to promote growth of human breast cancer cells. Use of fully shielded lights will help to reduce light trespass, and therefore benefit human health.

The committee also discussed the spectrum of light at night. Blue light is the most harmful — both for astronomy and impact on wildlife. The atmosphere scatters blue light more efficiently than red light (this is why the daytime sky is blue). Samples of

lights with different Correlated Color Temperature (CCT) were examined. Lights with high CCT appear bluer and are more harmful to the night sky. Lights with lower CCT appear redder in color, and are less harmful to the night sky.

The committee noted that solid state lighting (using light emitting diodes — LEDs) is becoming competitive with high intensity discharge lamps, and it soon will become more energy efficient. Most white LEDs produce their light using a blue LED emitting around 450 nm, and a phosphor that converts some of the blue light to green, yellow, orange and red colors. The blue emission from LEDs is close to the peak of the human circadian sensitivity, making it of concern. Lower CCT LEDs have smaller amounts of blue light.

The committee examined a draft model lighting ordinance (MLO) from the Illuminating Engineering Society of North America (IESNA) and the International Dark Sky Association (IDA). A final version of the MLO is due to be released shortly, and the SRC plans to continue to discuss the MLO and its possible applicability to Hawaii. The MLO includes different lighting zones.

The goals for the Starlight Reserve Committee include:

1. Full shielding of new and replacement lights statewide
2. Limits on the spectrum of new and replacement night lights (e.g., no bluer than the color of moonlight).
3. Limits on the amount of light permitted under energy codes (recommend adoption of the 2009 International Energy Conservation Codes).
4. Establishing lighting zones statewide.
5. Dimming of late night lighting, possible spectral shifting and motion sensor lighting.
6. Setting goals to reduce skyglow and nighttime lighting energy consumption by factors of 2.
7. Elimination of exceptionally bad lighting fixtures.

There was very strong agreement within the committee of the following items:

1. The legislature should allow the SRC to continue its work for an additional 2 years. The delay in establishing the committee has significantly hampered progress.
2. Legislation should be introduced in the 2011 session to require all new and replacement outdoor light fixtures brighter than 3,000 lumens in the state of Hawaii to be fully shielded.
3. Education of both the public and professionals about intelligent lighting is critically important, and will be very important if the goals of the SRC are to be achieved.

At both the second and third meetings, the SRC had problems establishing quorum, due to having committee members who work on the outer islands or out of state. Having a small budget to allow travel from the neighbor islands would be very helpful.

LATE TESTIMONY

Testimony in Support of SB 112, SB 165, SB 1496

Date: 10 February 2011

Submitted by: Joseph E. Ciotti, PhD
Director, Center for Aerospace Education
Hawai'i Teacher-in-Space/NASA Ambassador
Windward Community College

Dear Members of the Twenty-Sixth Legislature:

I am pleased to provide testimony in strong support of SB 112, SB 165 and SB 1496—all three of which address the strategic and timely growth of aerospace industry in the State of Hawai'i.

I've been intimately involved with space education in Hawai'i for over 40 years and can personally testify to the significant impact that past and recent commitments to this endeavor have had on our youth and the welfare of our State. I've witnessed this through my decades of teaching astronomy and space science at both the secondary and college level, through my extensive K-12 and community outreach efforts at Windward Community College's Center for Aerospace Education which has reached over 300,000 people, through the rocketry projects my Hawai'i Space Grant students continue to undertake, and through over forty years of experience I enjoyed at all three planetariums in Hawai'i—including designing and constructing two of them.

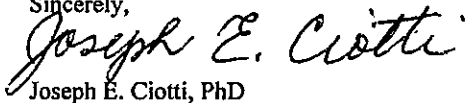
Following in the wake of its rich seafaring heritage, Hawai'i has already undertaken bold spacefaring ventures. From world-class astronomical observatories ... to NASA-sponsored *in situ* rehearsals of manned and robotic space missions ... to its role in international airline transportation and potential future space tourism, Hawai'i is uniquely poised for significant economic growth through the leadership choices it makes regarding the aerospace industry.

Hawai'i is currently perched to assume a prominent role in aerospace research and technology. The decisions made today by the Twenty-Sixth Legislature will determine the flight path our State will follow in a field that has potential for major positive impact on its economy. By committing to the development of a spaceplane launch/landing facilities in Hawai'i (SB 112), operation of space exploration and lunar research related activities as eligible local business (SR 1496), and support for the Office of Aerospace Development to carry out this bold and far-reaching vision (SR 165), Hawai'i will have laid its claim as the crossroads along this major space highway.

By recognizing aerospace as a strategic industry in Hawai'i, passage of these Senate Bills will provide the urgently needed support and boost to DBEDT's Office of Aerospace Development in fulfilling its responsibility to oversee the economic growth of this fast-paced and strategically important industry in Hawai'i.

I strongly support SB 112, SB 165 and SB 1496.

Sincerely,



Joseph E. Ciotti, PhD

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