

Health & Science

## Some cities are taking another look at LED lighting after AMA warning

By Michael Ollove September 25, 2016

If people are sleepless in Seattle, it may not be only because they have broken hearts.

The American Medical Association issued a warning in June that high-intensity LED streetlights — such as those in Seattle, Los Angeles, New York, Houston and elsewhere — emit unseen blue light that can disturb sleep rhythms and possibly increase the risk of serious health conditions, including cancer and cardiovascular disease. The AMA also cautioned that those light-emitting-diode lights can impair nighttime driving vision.

Similar concerns have been raised over the past few years, but the AMA report adds credence to the issue and is likely to prompt cities and states to reevaluate the intensity of LED lights they install.

Nearly 13 percent of area and roadway lighting is now LED, according to a report prepared last year for the Department of Energy, and many communities that haven't yet made the switch plan to do so. LEDs are up to 50 percent more energy-efficient than the yellow-orange high-pressure sodium lights they typically replace. They last for 15 to 20 years, instead of two to five. And unlike sodium lights, the LEDs spread illumination evenly.

Some cities say the health concerns are not convincing enough to override the benefits of the first-generation bright LED lights that they installed in the past three to eight years. New York is one of them, although it has responded to resident complaints by replacing the high-intensity, white LED bulbs with a lower-intensity bulb that the AMA considers safe.

Scott Thomsen, a spokesman for Seattle City Lights, which is responsible for the city's exterior illumination, dismissed the health concerns about bright-white LED lights, noting that they emit less of the problematic blue wavelengths than most computers and televisions.

After a year and a half of discussion and sampling, Lake Worth, Fla., is replacing its sodium streetlights with about 4,150 LED lights with an amber glow. "We found a color that made sense for the health of our city, and we're proud of the choice we've made," Michael Bornstein, the city manager, said.

7/19/2010 Same sitias are taking another look at LED lighting after AMA warning. The Weshington Doot

Mark Hartman, Phoenix's chief sustainability officer, said the city might go with a mix of the intense lights for major intersections and ballpark areas that need very bright light and a softer light for residential areas. He said the city would consider the health arguments, although he, too, mentioned the glow from computers and televisions. "Nobody says don't watch television or use your computer after 9 p.m. because of blue lights," he said.

## The first generation

Almost as soon as outdoor LEDs were made available, the federal government encouraged states and municipalities to use them, calling LEDs highly efficient for such applications as traffic lights and exit signs. But critics say federal authorities were too quick to endorse LEDs.

The Department of Energy and the Environmental Protection Agency "put a lot of push into them," said Michael Siminovitch, director of the California Lighting Technology Center at the University of California at Davis. "I call it a rush."

Siminovitch said the light from early-generation LEDs "really negatively impacts people's physiological well-being."

Lighting is measured by color temperature, which is expressed in "kelvin," or "K." The original LED streetlights had temperatures of at least 4000K, which produces a bright white light with a high content of unseen blue light.

Now, LEDs are available with lower kelvin ratings and roughly the same energy efficiency as those with higher ratings. They don't emit as much potentially harmful blue light, and they produce a softer, amber hue.

When 4000K and 5000K LEDs were installed, they drew mixed responses. Police and traffic-safety officials and many motorists liked them because they created a bright light that sharply illuminated the ground they covered.

But in many places, including New York City and Seattle, residents complained that the bright white light was harsh, even lurid. People described them as invasive, cold and unflattering.

Even before the AMA warning, some researchers raised health concerns. Some noted that exposure to the blue-rich LED outdoor lights might decrease people's secretion of the hormone melatonin. Secreted at night,

melatonin helps balance the reproductive, thyroid and adrenal hormones and regulates the body's circadian rhythm of sleeping and waking.

"As a species, we weren't designed to see light at night," Siminovitch said.

Meanwhile, the "dark sky" movement criticizes LEDs as a major contributor to what it calls the "light pollution" that humans cast into the night sky.

## Effect on sleep cycles

In its warning, the AMA cited the melatonin issue, noting that studies have linked bright LEDs to reduced sleep time, poor sleep quality and impaired daytime functioning.

It referred to evidence that exposure to high-intensity light at night might increase the risk of cancer, diabetes, cardiovascular disease and obesity. And it cautioned that intense LEDs have been associated with "discomfort and disability glare," which might impair nighttime vision for drivers.

Finally, the AMA cautioned about the harmful effects of bright LEDs on wildlife, particularly nocturnal animals, birds and insects.

"These lights aren't just bad for us," said Mario Motta, one of the authors of the AMA report, "they're bad for the environment, too."

The AMA did commend LEDs for their energy efficiency and effectiveness, but it urged cities to minimize bluerich outside lighting and recommended the use of LEDs no brighter than 3000K.

Tony Dorsey, a spokesman with the American Association of State Highway and Transportation Officials, said that the organization's environmental committee is studying the AMA's report but that association members haven't seemed concerned about the use of 4000K LEDs on roadways.

The Department of Energy said LEDs should be used with "prudence" but praised their overall performance. It said the AMA had added "another influential voice" to the issue.

Others, including the Lighting Research Center at Rensselaer Polytechnic Institute in Troy, N.Y., said the lights pose less risk than the AMA suggests. The research center pointed out that the AMA report is based on

extended exposure to high-intensity LEDs and said the blue-light hazard of LEDs "is probably not a concern to the majority of the population in most lighting applications."

Motta stood by the AMA's concerns about high-intensity LEDs and said there is no downside — either in cost or efficiency — to choosing a lower-intensity light.

## Sleeping in Seattle

Some cities are satisfied with their higher-intensity LED streetlights.

In Seattle, which has installed about 41,000 new lights since 2010, Thomsen, the spokesman for Seattle Light, attributed the early complaints to residents' surprise at the sharp difference in brightness between the old sodium lights and the new LEDs.

Light from the new fixtures is comparable to moonlight and provides excellent visual acuity for drivers, Thomsen said. Police especially like them, he said, because they enable people to distinguish colors at night. "The police say they get much better witness descriptions," Thomsen said.

Thomsen also noted that even though the Seattle LEDs are rated at 4100K, that is significantly lower than most computer screens, laptops and televisions.

- But Pete Strasser, technical director at the International Dark-Sky Association, said moonlight contains far less blue light than do high-intensity LED lights.
- A little more than a year ago, Gloucester, Mass., was on its way to replacing its sodium streetlights with 4000K LEDs. But then city planner Matt Coogan began reading about health and environmental warnings. He also had residents sample the 4000K lights against 3000K models.
- Next month, the city is expected to finish installing its LEDs, but they will be 3000K rather than 4000K.
- Coogan knows the debate over the health risks of LEDs rages on. But he doesn't want to be on the wrong side of history.

"I didn't want to get 10 or 15 years down the road and find out we had exposed our people to a health risk," Coogan said. - Stateline 口772 Comments The Washington Post Others cover stories. We uncover them. Limited time offer: Get unlimited digital access for less than \$1/week. Try 1 month for \$1 Send me this offer

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