



Issue: Preserving The Night Skies

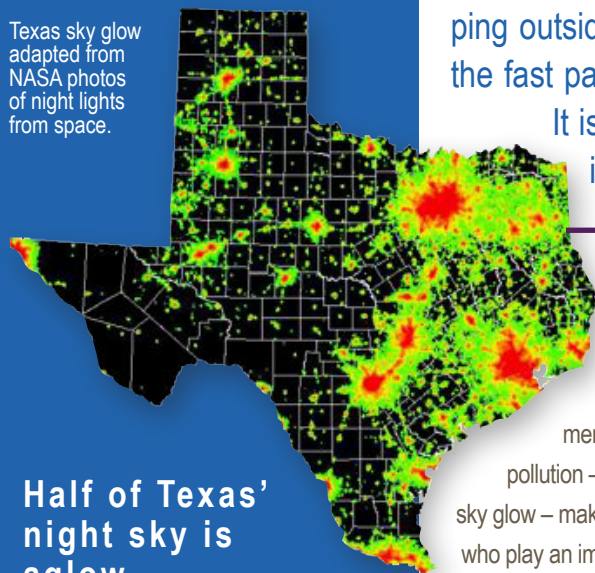


HCA is a passionate community caring for the unique features, spring-fed streams, heritage ranch lands, spectacular beauty and culture of the Texas Hill Country for the benefit of future generations.

There is something magical about the starry night sky in the Hill Country. Stepping outside on a crisp clear night to gaze at the stars helps us escape from the fast pace of our daily lives and connect with the natural world around us.

It is essential to ensure that our lovely night sky is not lost due to ever increasing light pollution.

Texas sky glow adapted from NASA photos of night lights from space.



Half of Texas' night sky is aglow

Population growth in Texas cities, towns and transportation corridors has greatly increased light pollution to the extent that most Texans can no longer see the Milky Way at night.

The darkest skies in North America belong to the McDonald Observatory, located in the Davis Mountains of West Texas. As responsible neighbors, the Hill Country is obliged to help protect this unique scientific and cultural resource.

Outdoor lighting has carelessly, and often unintentionally, increased light pollution. The trend goes hand in hand with population growth and land fragmentation. The undesirable effects of light pollution – glare, light trespass, light clutter and sky glow – make our region less attractive to visitors who play an important role in many local economies.

There is good news, however, this problem is relatively easy to control and easy to “fix.” Unlike other forms of pollution that seem so insurmountable to cure, once we learn how to use proper lighting, the starry night can easily be restored.

“The stars are the jewels of the night, and perchance surpass anything which day has to show.”

– Henry David Thoreau

Modern and appropriately directed fixtures can keep light on the property and eliminate energy waste. This simple approach exemplifies energy conservation, respect for private property rights and makes for good business and good neighbors.

The HCA Night Sky Team has helped launch community partnerships and a series of educational programs to address light pollution. Many Hill Country cities have already passed lighting ordinances advancing the momentum to protect our starry nights. Our Hill Country region is on its way to being known as a place where the stars shine at night and you can be part of this movement. The benefits go far beyond health, beauty and tourism appeal – reducing light pollution reduces electric bills and saves money!



hill country alliance

Communities Working to Preserve Night Skies

How to Preserve Night Skies

- **Aim lights down** – light should project below and out to the sides of the fixture, not letting any light escape above the horizon. Install lights so the fixture is above the area to be illuminated. Light an area from below only when all of the light will be blocked from shining above the horizontal plane.
- **Shield every light** – all lights should be installed and shielded to hide the source of light from any normal viewing point. Eliminate glare and protect eyes from directly viewing the light source. Light trespass is usually solved when outdoor lights are shielded so the source of light cannot be seen from neighboring properties. Shielded, concentrated light requires less wattage than an unshielded fixture to achieve the same amount of illumination to light the area of interest. Thus, it saves money.
- **Reduce the amount of light** – select the light's wattage, or more accurately, the number of lumens, for the desired application. Consider that very bright light can make nearby areas dangerously dark, actually degrading security.
- **Use lighting only when needed** – leaving lights on when no one is there to use them wastes energy and money. Use a switch, timer, or motion detector to conserve valuable resources. Lighting unoccupied areas has not been shown to keep criminals away and may even attract them. But all lights, even those on timers or switches, still need to be shielded.
- **Work with electric power suppliers and local governments** – encourage utilities and local governments to start taking steps now to reduce light pollution and implement smarter night lighting policy as a standard business practice. Help educate citizens, consumers, institutions and businesses on the importance of preserving the quality of the Hill Country's night sky.

The Kimble County Example

Kimble County passed a resolution in 2011 supporting the preservation of the night sky, and shortly after, the City of Junction followed suit. These resolutions support voluntary efforts to reduce light pollution by encouraging the use of non-intrusive, cost effective light fixtures. The county is committed to educating and encouraging land-owners, businesses, residential communities and public entities to join in this commitment to reduce energy consumption, save money and reduce light trespass. As County Judge Andrew Murr stated, "The night sky is part of the region's scenic beauty that brings significant economic benefits to the community." HCA secured funding in 2012 to retrofit public lighting in the city of Junction and surrounding rural area. Educational programs are continuing in the county and community efforts are now focused on encouraging commercial property owners to join this volunteer movement.

Electric Providers Stepping Up to Help

The Pedernales Electric Cooperative (PEC) adopted a board policy in 2011 to minimize light pollution and its adverse effect on the viewing of night skies. The PEC now has lighting shields available on request for PEC Co-op members. American Electric Power (AEP) is also doing their part. They have made themselves available to do assessments and light retrofits in their service area. They are knowledgeable about proper lighting and have been helpful with the HCA/Kimble County partnership.

State Parks

Texas State Parks are taking a hard look at their fixtures and making adjustments to provide adequate lighting for security while preserving the night sky. State Parks are great places to escape the city lights and truly discover what the night sky has to offer. Enchanted Rock State Natural Area recently retrofitted existing light fixtures to reduce light pollution. Other parks are following suit.

Lighting Ordinance Trends

Many Hill Country towns have passed outdoor lighting ordinances including Blanco, Dripping Springs and Boerne. Sample ordinances are available on the HCA website. Unfortunately, most counties in Texas (with the exception of those surrounding the McDonald Observatory) do not have legislative authority to enact rules for outdoor lighting.

Blanco Chamber Recognizes Businesses



The Blanco Chamber of Commerce created a Business Recognition Program to acknowledge local businesses committed to night sky friendly lighting. This voluntary program endorsed by HCA,

recognizes businesses who strive to eliminate light trespass from their property. Look for the Night Sky Friendly Business sticker when visiting Hill Country businesses. Other communities such as Junction and Johnson City are adopting similar programs. A "Program in a Box" which includes all of the resources necessary to replicate this simple program is available to help your town jump on board.

Dripping Springs' Commercial Properties Taking Care of the Night Sky

The Hill Country town of Dripping Springs recently created a development agreement for several large commercial additions built within the community. The lighting portion of the agreement called for shielded lighting to reduce glare and light trespass. Reducing glare not only increases safety on the development property, but also enhances traffic safety on nearby roadways. At the HEB's fuel service station, the flush mounted, under canopy lights in the fuel pump area use about 1120 watts, compared to the 2538 watts in the original conventional lighting plan, saving over 50% in energy costs. The pumps and under canopy area are attractive and safely lit. Home Depot reduced their outdoor lighting installation from about 47,700 watts in the original lighting plan to about 37,400 watts after implementing requirements of the development agreement. Besides realizing significant cost savings, control of glare and light trespass onto neighboring properties is virtually eliminated.



Friendly Outdoor Lighting Saves Money

FACT: Approximately 30% of the energy cost powering unshielded bulbs is uselessly illuminating the night sky. This wasted energy costs \$2.2 billion annually in the United States alone. Locally, the immense volume of wasted light contributes to light pollution and the steady loss of a treasured Hill Country resource, our brilliant starry skies.

PROBLEM: Consider the popular outdoor halogen floodlight. We commonly see these everywhere, aimed willy nilly, often illuminating areas that neither need nor want the light ...such as a neighbor's bedroom window or the night sky.



Typical floodlighting with two 90-watt halogen bulbs

Floodlights can be a big problem, even if you live out in the country.



SOLUTION: By taking a couple of simple steps, this homeowner could do his neighbors and the night sky a big favor...and save money in the process! The homeowner could shield the light, redirect it to shine downward inside his own yard, reduce the wattage of the light bulbs and still have the same amount of usable light within the desired area.

In this example, the homeowner could replace the two 90 watt halogen floodlights with two 50 watt halogen bulbs, put on a couple of Parshield Glare Visors and aim fixtures downward. These simple steps would concentrate light where it is needed and save energy.

So not only would glaring light trespassing onto the neighbor's property and up into our night sky be eliminated, he would also save a large amount on his electric bill.

Be considerate to your neighbors- turn off or shield your lights. It's easy!



Learn how to make your outdoor lighting night sky-friendly while saving yourself money, visit <http://www.hillcountrynightskies.com/>

DOLLARS AND SENSE:

If the homeowner in our example is a customer of the Pedernales Electric Power Co-operative (PEC), he is paying 7 cents per kilowatt-hour for his electricity. Every hour the two 90W lights are on costs him 1.3 cents (180 watts/1000 watts times 7 cents). Assuming the light is on dusk-to-dawn all year, it would be on some 4100 hours and he would pay PEC almost \$52 a year to run it. Wow! Those cents add up quickly. Now how many of these lights does he have around his house? You do the math for multiple lights.

But this homeowner is smart. He shielded and redirected the light and was able to replace the two 90 watt halogen bulbs with two 50 watt bulbs. Now every hour it shines only costs him 7/10th of a cent. Big difference. If he still runs it all night all year, his electric bill will be \$28.70 – almost half of what he was paying before just by having the light properly sized, aimed and shielded. He stopped wasting energy by not shining it into the sky or onto his neighbor's property. If he used 15 watt LED bulbs instead of the halogens, his annual cost would tumble to just \$8.61.

The homeowner saves even more energy and money if he puts the light on a timer or, better yet, a motion detector. Shining a light all night might make you feel safer, but studies show that it does not stop crime. Studies also show that artificial night-lights stop almost all living creatures, including humans, from producing melatonin needed for health. Why light all night when it's so easy to save money, make better neighbors, protect wildlife and preserve the night sky? Anyway you cut it, it's a "win-win" situation.

SAVE ENERGY, SAVE MONEY, SAVE WATER:

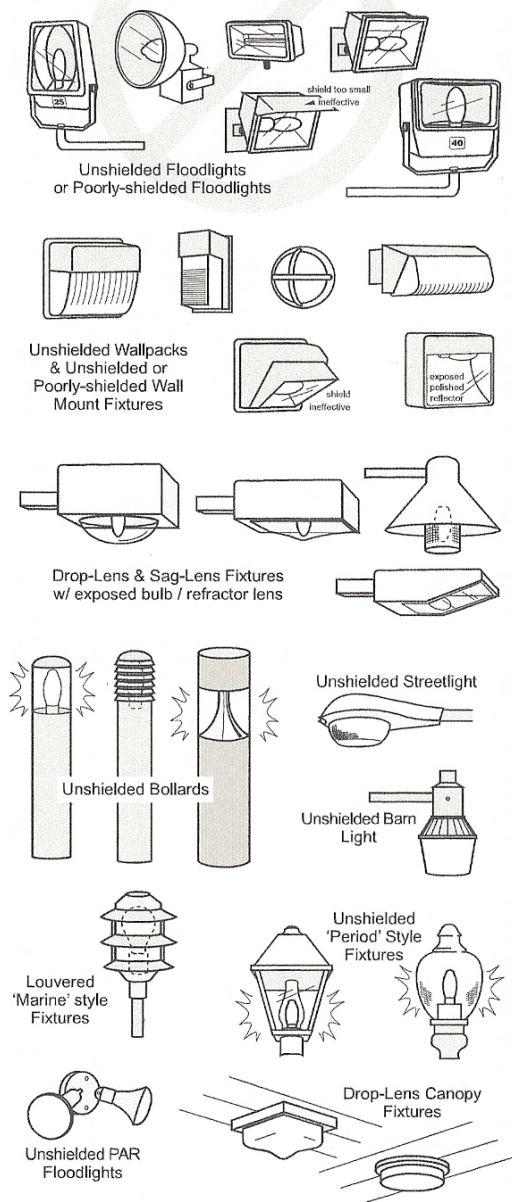
Homeowners might also be happy to learn that, in the big scheme of things, having proper outdoor lighting also saves water. Forty percent of all surface water in Texas, at some point along the way, is used for cooling or for generating steam for electricity provided on the state's grid. Every watt saved actually translates to water conservation. So, by curbing light pollution, we're also helping preserve another precious Hill Country resource, our water.

Better Lights for Better Nights

Help eliminate light pollution. Select the best fixture for your application using this guide. Use the lowest wattage bulb appropriate for the task and turn off the light when it's not being used. If you are considering LEDs, select one that emits light with a color temperature at or below 3200K. See the column to the right for more information.

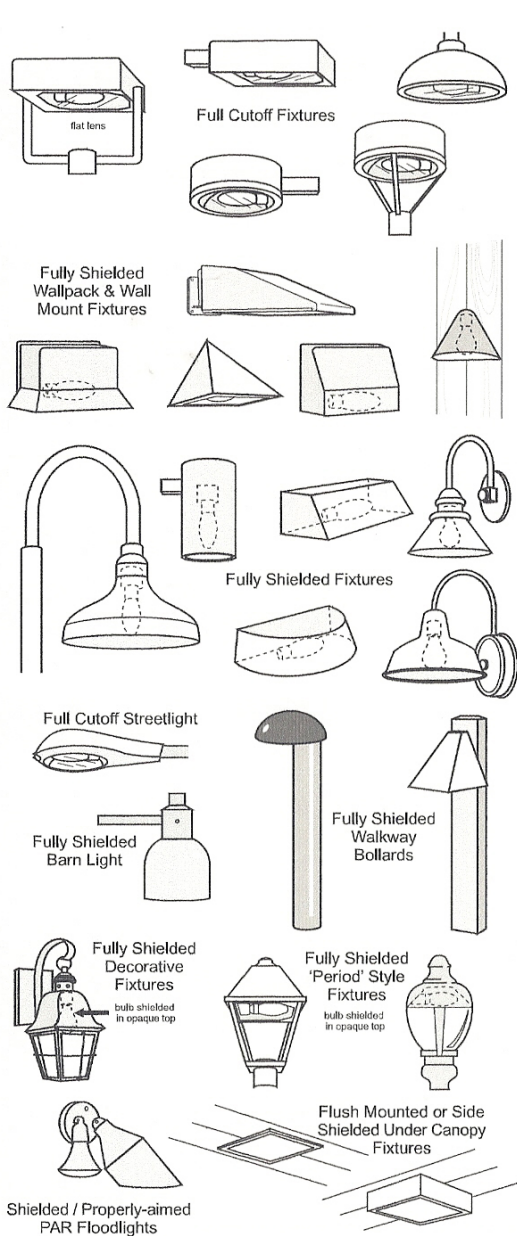
Unacceptable/Discouraged

Fixtures that produce glare and light trespass.



Acceptable

Fixtures that shield the light source to minimize glare and trespass.



Are LEDs good for Night Sky Preservation?

Many LEDs on the market are labeled “Dark Sky Compliant.” Unfortunately, that label is applied far too broadly and often neglects a very important characteristic of the light: the correlated color temperature (CCT), or more simply, the light’s color.

CCT is a measure of how amber or blue the light appears. Light that is more amber (warmer) is significantly better than light that is more blue (cooler). Although it appears brighter, bluer light actually decreases visibility because it produces more glare. It is more disruptive of starry nights, of melatonin production in humans and wild-life, and of a relaxed nighttime streetscape.

CCT is measured in degrees kelvin (K). Lower numbers correspond to warmer—that is, less intrusive—light. LEDs that emit light at or below 3200K are significantly better than those that emit light above 3200K. LEDs that emit light at 4000K or higher really should be avoided.

The good news is that amber LEDs are on the market and are just as efficient as the bluer LEDs. The Hill Country Alliance is here to work with electric utility providers to make sure that Night Sky-friendly LEDs are used wherever LEDs are installed.

Helpful Resources

You can find more information about preserving the Night Sky in the Hill Country at www.hillcountrynightskies.org. For more information about preserving the Night Sky generally, including a list of recommended lighting fixtures, visit our partners in Night Sky protection, the International Dark-Sky Association, at www.darksky.org.

HCA’s Night Sky Team is full of knowledgeable volunteer leaders ready to help you do your part at home, on your land, at your business and in your community. For assistance contact info@hillcountryalliance.org.

15315 Hwy 71 West
Bee Cave, TX 78738
512-263-9147
info@hillcountryalliance.org
www.hillcountryalliance.org



hill country alliance