



Dark Sky Advocate Supplemental Information

The Dark Sky Advocate program allows you to create the tools that you need to bring the subject to the public in an effective way. It provides an excellent start to confront the issue of light pollution. This supplemental section contains information which may prove to be very helpful in your quest to become a Dark Sky Advocate.

Personal economic issues

Free, unshielded dusk-to-dawn fixtures from your electric utility may initially sound like a good deal. But their true cost involves the cost of electricity over time. Shielded low pressure sodium fixtures are a better value.

A. A 175 watt dusk-to-dawn Mercury vapor fixture retails for about \$30. It actually uses 210 watts due to its ballast.

B. It burns 4100 hours per year.
 $11.25 \text{ hours/day} \times 365.25 \text{ days/year}$

C. Its annual energy usage is 861 kwh.
 $4100 \text{ hours} \times 210 \text{ watts} = 861,000 \text{ watts} = 861 \text{ kwh}$

D. Its annual energy cost is \$69.
Assuming the electric rate is \$0.08/kwh,
 $\$0.08/\text{kwh} \times 861 \text{ kwh} = \69

E. So, for that “free” Mercury vapor fixture that the utility gave you, the annual cost for operating it is \$69. The electric utility recoups its investment quickly.

F. A shielded low pressure fixture can use only 30 watts, giving an electrical usage of \$9.84 per year. Quite a savings!

Raising Awareness

Funny thing about light pollution: It's a subject many people like talking about, but one that too few actually do anything about. It doesn't need to be that way, though...

Where is everyone?

The number of "Night Sky Enthusiasts" (NSE) in the United States has been estimated to be about 300,000. This includes stargazers, amateur astronomers, professional astronomers and all around purveyors of our night skies. With this large number of interested people, why isn't more being done to protect our dark skies?

Where are all the NSEs telling their public officials about their desire for quality outdoor lighting?

Where are all the NSEs telling their home improvement centers to promote and sell shielded light fixtures?

Where are all the NSEs telling their utility companies to promote energy conservation and to publicize shielded lighting, especially dusk-to-dawn fixtures?

Where are all the NSEs speaking to their local governments about effective lighting ordinances?

Night Sky Enthusiasts are out there, they are just not doing these things. They are not engaged.

Return to the observing sites of your youth, if you can find them. Chances are that they are no longer filled with stars and the soft glowing band of the Milky Way. Instead, there is nuisance sky glow blotting out all but the brighter stars. You have lost another great observing site.

As amateur astronomers, we monitor the night like no one else. When we begin to lose it, what can we do? The problem can seem so overwhelming that we don't know where to begin, so we do nothing. After all, think of the

magnitude of the problem. Think of:

- all the city residential lights,
- all the city street lights,
- all the business parking lot lights,
- all the sports and recreation lights,
- all the commercial lights,
- all the billboard lights,
- all the car dealership lights,
- all the gas station and convenience store lights,
- all the mall lights,
- all the dusk-to-dawn lights,
- people's perceptions of crime,
- the Wall Street emotions of fear and greed,
- all the indifference towards dark skies,
- the generational amnesia of the night sky,
- all the bad feelings and hostility towards government interference,
- and your time commitment involved.

But there is good news: All is not lost! There are plenty of good lights around us, lights that have been recently installed.

For change to occur, people must speak up. As was mentioned earlier, we are the ones who know the night sky better than anyone else.

Tell others about good and bad lighting and their effect on light pollution. People will remember. You may not realize it, but most likely they won't be able to help themselves from pointing out all the bad lights that they come across. You have won them over; they are now on your side.

Create and present informative and persuasive presentations

Presentations are an effective way for the Night Sky Enthusiast turned Dark Sky Advocate to educate many people at one time. While many people have heard of light pollution, few know the details or how they can help. Giving presentations is often the best means to reach the general public and to influence your local elected officials.

Planning and zoning commissioners, city councils, and county supervisors are

the people in authority who create lighting ordinances and approve new developments. As intimidating as it seems, it is imperative that they be contacted and educated in proper lighting methods. Remember, they are just as likely as you to have a neighbor with an offending light. Some of them may want to tell you and everyone else in the room about it.

Government officials want to know about solutions and how they can save the taxpayers money. Be aware that the wheels of government move slowly. Just because they don't jump on the bandwagon doesn't mean that they have dismissed the issue.

Presentations need to be persuasive, which may seem difficult. When faced with that requirement, some potential speakers say, "Persuade people to turn off their lights? I can't even get my kids to turn off their bedroom lights!" Here are a few techniques and suggestions which make it easier.

1. The first rule of public speaking is knowing your audience. Each presentation must be tailored to its intended audience. You wouldn't give the same talk to a civic group as you would to a zoning board. Be sure to use suitable technical terms for each audience so your points are best understood. People want to know how light pollution affects them.
2. Keep it local. It has been said that "All politics is local." In that light, pun intended, every presentation should include plenty of local references, photographs, and examples. People have enough to consider without worrying about the light problem three states away. Don't insult anyone, though, with the negative local references that you use in your "bad examples."
3. Use a little humor. As you investigate the problem, you'll soon find that almost everyone likes talking about it — including government and elected officials — and that they have a favorite bad example. Some of these are bound to be quite amusing. Remember, almost everyone has a story!
4. Use "Earth at Night" posters, but also have local enlargements. People see the problem, nod their heads, and are on your side. The City Lights overlay on *Google Earth* is a good source for this.
5. Speak about the economic wisdom of using shielded, lower wattage fixtures. Study the IDA information sheet #26: *Economic issues in wasted*

and inefficient outdoor lighting.

6. Talk about crime. Try an unusual approach by discussing outdoor lighting from the criminal's point of view. After all, a prowler needs light and is only too happy to use the glaring, unshielded outdoor light provided by the homeowner.

7. Give demonstrations. Besides breaking up the talk, they bring your points home. How about showing the glare from a fixture that has no shielding and from one that does? (Lamp shade vs. no lamp shade.) That is something they will remember.

8. After showing the problem, give practical solutions. People want to know how they personally can help. These solutions can be gleaned from the IDA information sheet, *Simple Guidelines*. Discuss the role of timers and motion sensors.

9. Leave the audience with handouts.

Outdoor lighting ordinance

When contacting county supervisors and city councils, push them gently toward enacting or improving an outdoor lighting ordinance. The wording of any eventual ordinance should contain the ideas of "the right amount of light directed at the right place at the right time." The ordinance should require full cut-off shielded fixtures, and should establish maximum illumination levels for various situations, and should prohibit light trespass onto neighboring properties. Of course, direct them to the resources of the IDA.

Unfortunately, once an ordinance is enacted more work needs to be done. Enforcement is an on-going process and many agencies don't have the necessary staff nor funding. Find out to whom to report non-compliant lighting.

Nothing prevents concerned club members from submitting their own lists of possible violators. However, be sure you know what those regulations stipulate before you act.

Get to know your local media

Continue raising awareness by writing letters-to-the editor, and submitting op-ed pieces to your local paper. Be prepared to hear criticism of your views. Generally, criticism falls under one of these two arguments: The utility company expresses concern that its customers don't want shielded lights (probably due to safety concerns), and an individual protests, "I don't want the government telling me what to do." The power company wants to sell power, not to save electricity. Accordingly, it acts in its own best interest, not that of the community as a whole. People who fear government intrusion may react better if the topic is compared to noise pollution. No one puts up with a neighbor who has music blaring at 2 a.m.

You, and the other members of your astronomy club can recognize the good lighting in your community by presenting annual "Good Lighting" awards. Send a press release to the newspaper, and to the local radio and TV stations. The positive publicity will go a long way in generating good will and bringing the issue in front of the public. This can be held in conjunction with *National Dark Sky Week* or *Earth Hour*.

Earth-at-Night posters

Posters of this type are excellent at directly illustrating wasted light. One problem with them is that they are not local. People want to see what it's like in the area where they live.

Dillon's Rule

The late 1800's is known as being a time of big city corruption. Justice John Forrest Dillon of the 8th circuit court in 1872 outlined a legal principal dictating that all laws originate with the state, not with its municipalities. The immediate affect was that local fiscal malfeasance was curbed and statewide regulations were set. However, this meant that in the "Dillon Rule states," new areas of regulation were not permitted unless specifically granted by state legislatures. Some states — Home Rule states — however, have granted local governments the authority to enact their own regulations.

Since light pollution and controlling outdoor lighting are relatively new issues, being 20 years old or so, many Dillon Rule states have not granted municipalities the authority to regulate lighting. If there is no state regulation on the topic, then there are no enforceable local regulations either. Obtaining the necessary legal permission requires the state's legislature to enact *enabling legislation*, an arduous process. Granting any authority to municipal government erodes state power which many state legislatures are unwilling to undertake regardless of the purpose of the regulations.

For a summary Dillon's Rule and what it means for municipal governance, see "Dillon's Rule and the Birth of Home Rule," by Diane Lang, Assistant Information Services Director
Reprinted from The Municipal Reporter, December, 1991

Dillon's Rule: Good or Bad for Local Governments?

Committee Members: Chair, Sally Ormsby; Members, Edith Appel, Pat F..., Jane Gatten, Fran Haffner, Tala Korman, Mary Nightinger, Jean Packard, and Mary Vidler.

Introduction

There have been numerous studies of the pros and cons of state and local governments under Dillon's Rule versus home rule over the past few decades—and longer. Our own meetings in October and November 2002 focused on Virginia's government structure and the National Association of State Elected Officials' (NASERO) study of Dillon's Rule and Home Rule in 1996. The NASERO study type of local governmental systems, as well as the pros and cons of Dillon's Rule and Home Rule.

Dillon's Rule, by asserting that there are no such things as inherent rights of local self-government, characterized the emerging power struggle between state and local governments. Local governments must derive their powers from the state rather than from their own citizens. The state can expand or contract its powers at any given time. Senator Callahan's 1996 study of Dillon's Rule has been particularly influential in this regard. Dillon's Rule has been particularly influential in the development of government structures in Virginia since 1996 and is a fundamental rule of government in many states.

Redevelopment Research Group

DILLON RULE / HOME RULE Last revised: August 16, 2005

The resources in this reading list are meant to provide the reader with a general overview of one aspect of redevelopment: Dillon Rule/Home Rule. Most of the materials included are freely available on the internet, available in the Virginia Beach Public Library cardholders' series, or available to Virginia Beach Public Library cardholders. This list includes instructions for locating these resources.

Dillon's Rule

In an issue that appeared in the 12th issue of the League of Women Voters' newsletter, "Dillon's Rule and Home Rule," the League's staff discusses the pros and cons of Dillon's Rule and Home Rule.

DILLON'S RULE AND THE BIRTH OF HOME RULE

by Diane Lang, Assistant Information Services Director
Reprinted from *The Municipal Reporter*, December, 1991

"Whoso desireth to discourse in a proper manner concerning corporated towns and communities must take in a great variety of matter and should be allowed a great deal of time and preparation...The subject is extensive and difficult."

Thomas Mador, *British Historiographer*, 1726. (*The Law of Local Government Operations*, Rhyme, p. 1)

Many of the inquiries the League staff receives have, at their root, the question of whether a municipality can exercise a particular power. The answers to these questions generally involve interpretations of the New Mexico statutes in light of something called "Dillon's Rule," named for Judge John Forest Dillon, a noted local government scholar. As the Chief Justice of the Iowa Supreme Court over 100 years ago, Judge Dillon authored two seminal opinions establishing the modern rule of law by which the powers of local government are evaluated.

Partly because Judge Dillon was considered to be a great authority on municipal law -- albeit one who distrusted local government -- his rule was adopted by other state supreme courts and ultimately by the United States Supreme Court in the early twentieth century. Dillon's Rule became cemented into the legal system as a fundamental rule of statutory construction. It still is the most determinative factor in interpreting general and specific powers of non home rule municipalities in New Mexico as well as in most states around the country.

WHAT IS DILLON'S RULE?

Under Dillon's Rule, the state legislature is recognized as having plenary (complete) control over municipal government except as limited by the state or federal constitution. As a result of this complete legislative control, local government powers are quite limited and only extend to those powers which are:

- (1) granted in express words;
- (2) necessarily implied or necessary to the exercise of the express powers.

Handouts

An informative handout will keep the issue in front of people, if only for a short while. Business card handouts with pertinent points listed make it convenient for people to take the topic home with them.

Good Neighbor OUTDOOR LIGHTING

PRESENTED BY THE NEW ENGLAND LIGHT POLLUTION ADVISORY GROUP (NELPAG) AND SKY & TELESCOPE.

What is good lighting?
Good outdoor lights improve your sense of security, while reducing energy costs, and ugly light pollution.

Why should you care?
More than 100 million Americans live in areas with light pollution. Light pollution is a growing problem that affects our health, safety, and the environment.

Quality of Light ... Quality of Life
The right amount of light directed at the right place for the right amount of time.

1. Combat Light Pollution: direct light down
2. Prevent Glare: shield light fixtures from your eyes
3. Avoid Light Trespass: prevent your light from straying onto your neighbor's property

International Dark-Sky Association: www.darksky.org

Energy Wastage
Light is being spilled where it is not needed, and is being wasted as it goes up into the sky. This waste results in high operating costs. Each year we waste more than a billion dollars in the United States needlessly lighting the night sky.

Excess Lighting
Some homes and businesses are flooded with much stronger light than is necessary for safety or security.

How do I switch to good lighting?

1. Provide only enough light for the task at hand; don't over-light, and don't spill light off your property. Specifying enough light for a job is sometimes hard to do on paper. Remember that a full Moon can make an area quite bright. Some lighting systems illuminate

Efficient Outdoor Night Lighting

Inefficient lighting fixture: Light is scattered in all directions, including upwards and sideways.

Efficient lighting fixture: Light is directed downwards and shielded from the sky.

Area Flood Light

BAD
Waste light goes up and sideways.

GOOD
Directed light down with hood.

Public enlightenment and raising awareness

The key to change is raising public awareness. Without the public's support, little positive change will occur. The Dark Sky Advocate will develop and give lighting presentations, prepare handouts, draft letters to public officials and the media, and understand the implications of Dillon's Rule.

The power of us all

The 300,000 Night Sky Enthusiasts need to become engaged in the struggle against light pollution. We have just suggested a list of actions that one person can pursue and that members of an astronomy club follow.

The power of one voice can bring the problem of bad lighting to the attention of many. It is almost guaranteed that people have a hard time not noticing bad lighting after being shown the problem. Everyone has a story, they just need to know that they are not alone and that there is a positive course of action.

The power of us all drives the engine that affects change. Speak to your public officials. Raise the issue through your local media. Face the problem directly by addressing crime and safety concerns and by highlighting the economic wisdom of good lighting practices.

Consider this: Here lies a great opportunity for you, as a Dark Sky Advocate, to make a positive, dramatic impact on your community that will be long lasting and far reaching. Can you imagine any better way you can influence the future?

Resources

1. Various IDA handouts: provide a suggested list of pertinent IDA material.
<http://www.darksky.org>
 - #26: Economic issues in wasted and inefficient outdoor lighting
 - #51: Lighting and Crime
 - #182: Artificial Lighting and Wildlife — A Moth to a Flame
 - #187: Lighting and Wildlife: 101 Introduction

Simple Guidelines for Lighting Regulations

2. "Earth at Night" posters; City light overlay on *Google Earth*.
3. Books on why the dark hours are important:
The Ecological Consequences of Artificial Night Lighting
4. Urban observing book:
"City Astronomy," Scagell, Robin, Sky Publishing, 1994.
5. Astronomical League Urban Club:
<http://www.astroleague.org/al/obsclubs/urban/urban.html>
6. Explanation of Dillon's Rule
"Dillon's Rule and the Birth of Home Rule," by Diane Lang,
Assistant Information Services Director
Reprinted from The Municipal Reporter, December, 1991
7. IDA slide sets.
8. IDA postcard template to Planning and Zoning Commissioners.
9. SELENE (Sensible and Efficient Lighting to Enhance the Nighttime Environment): <http://www.selene-ny.org/>
How Glare Reduces Safety
10. General overview article: Owen, David, "The Dark Side," *The New Yorker*, August 20, 2007.