

Dark Sky Stakeholders Group (DSSG) Meeting Notes  
April 7, 2009

1. DSSG attendees watched the NY Times video on light pollution
2. Introductions
3. Nathan Pryor discussed light pollution legislation, Title 49, Chapter 7, Article 1, Light Pollution. Mr. Pryor said there is no action on this in the state legislature and action is not likely, due to the legislature grappling with the state budget.
4. Dan Brocius reviewed March DSSG topics via a PowerPoint.
5. Chris Luginbuhl discussed practical aspects of lighting code design and implementation using the Lighting Code Handbook. He explained the critical foundations for a lighting code to work. He discussed the 6 critical elements of a Model Lighting Code (MLO).
  1. Shielding
  2. Lighting amounts
  3. Lamp types
  4. "Special" lighting uses
  5. Roadway lighting
  6. Signs

Critical Elements

1. Shielding
  - Issues:
    - training to recognize what is and what is not shielded
    - energy fine tuning

Buckeye said they want to know how to retrofit shields on existing lighting (eg. trying to get businesses to retrofit lights and Buckeye staff do not know the range of options available). Chris Luginbuhl said there is a lot of variation and cost in lighting and you end up getting what you pay for with lighting. He said lighting is not a very large portion of a municipal project and is often done last.

Mesa asked about the differences between fully and partially shielded lighting. Chris Luginbuhl replied that photometric is better than geometric for measuring partially shielded lights. Preference is to get away from partially shielded definitions. Fully shielded light definitions are much better for light pollution.

James Truman, resident from the city of Surprise, asked what the light limit is for comfort level of humans. Chris Luginbuhl replied that full cut offs do not protect humans because there is a lot of glare. He asked why light sources are not shielded. Chris Luginbuhl said the glare is improved with shielding but lights still have glare due to light reflecting off the shield. James Truman said it would be better to have light even

narrower to the task. Chris Luginbuhl said he does not have an answer for how to eliminate glare completely. He said glare affects the human eye and a light meter cannot provide a reading for glare. Glare is how bright it is to the eye and how the eye adapts to it. Glare is not defined in the code.

Glendale asked if the actual height of light fixtures is a factor. Chris Luginbuhl replied that the higher the pole the further away the light will fall away from the pole. It is better to go up higher to get light to spread out. Height limits on poles are not always helpful as more poles will be needed to light an area. Pole heights are not recommended for inclusion in lighting codes.

### Critical Elements

#### 2. Lighting amounts

Issues:

- Unfamiliarity
- Corporate “standards”

Critical to address in parking lots since they can be overlit due to highlighting businesses to make them look brighter/cheerier. There are no limits on the amount of lights so businesses are taking advantage of the lighting amount. It is suggested to use lighting lumens. Lights are brighter when new and they fade with age. Use initial lumens measure which is amplified to accommodate fading. Foot candle measurement is light on the ground. Lumen measurement is from light at the bulb. Light trespass from one property to another can be defined in the code.

Mesa said they require a photometric study for most projects. Mesa asked if it would be useful to make it a standard requirement for all projects/applications. Chris Luginbuhl said it is good to add the issue of photometric reports for lights and for sites. He said most city staff need training to interpret a photometric study or light report. To make it simple he suggested stating, “fully shielded.” The code will become more complicated when a jurisdiction inserts the need for a photometric study.

The lighting community recommends the MAG area to be one zone.

Dan Brocious said that the Outdoor Lighting Code Committee in Pima County discusses issues prior to Planning and Zoning or City Council meetings. He said uniformity and consistency is easiest for users of lighting codes.

### Critical Elements

#### 3. Lamp Types

Issues:

- Limit white or blueish light sources (car headlights)
- Color recognition (LPS)

Lighting community encourages yellow lights.

Glendale has Low Pressure Sodium (LPS) street lights. It would be difficult to ask all of Maricopa County to implement LPS street lights due to cost and politics. These lights have a problem with color rendition and police departments have complained about them.

Peoria is exploring using LED for some street lights and asked how it would be integrated into a code. Chris Luginbuhl replied that LED can be implemented into a code. He said there are yellow LEDs but most common are white or blueish LED lights. He said they are akin to fluorescent or incandescent lights. LED is not reaching the energy efficiency of HPS or LPS lighting. Currently, there is not much data available on LED lights.

Liz Alvarez said that at the end of May or beginning of June there is a conference that will address LED lighting and Liz encouraged agencies to check back with astronomy community for more information.

#### Critical Elements

##### 4. "Special" lighting uses

Issues:

- Sports fields
- Corporate and sports association "standards"
- Serviced station canopies
- Auto dealers
- Billboards?

#### Critical Elements

##### 5. Roadway lighting

Issues:

- Lighting system ownership (ADOT or others own it)
- Professional design usually involved
- Make sure roadway lighting is included in lighting ordinance and vice versa

#### Critical Elements

##### 6. Signs

Issues:

- Corporate "standards"
- LED billboards: enforceability
- Corporate resistance
- Sedona McDonalds has copper golden M

#### Next steps

Chris Luginbuhl said he needs to gather more information from member agencies to develop a pattern code for the Maricopa region. He suggested measuring each community and determining the priorities. He said the end goal is to have a similar code adopted by all MAG member agencies. He said he would distribute a MLO for review and comment on what does and does not work in each community and discuss it at May meeting.