

June 1, 2009

Dear MAG Dark Sky Stakeholders Group;

As this panel has been assembled to address light pollution issues relating to the general community at large, perhaps a more thorough examination of the matter of shielding of light fixtures is necessary. To the general public, light pollution relates to what they see from where they are at any particular time of night, which is usually at ground level in Maricopa County. If shown a comparison diagram between the light patterns of a full cut-off light fixture and a fixture which shields the light to 55-65 degrees from vertical, the latter is chosen almost 100% of the time,

Due to initial efforts from groups working with light pollution, the "full cut-off" fixtures have become the norm for most major outdoor lighting fixtures. Typically, this style of fixture directs light downward with an internal shield of some sort. However, this style of fixture also allows indirect light, or glare, to travel outward from the fixture in varying degrees of brightness all the way to the horizon, below the level of the fixture.

Shielded fixtures, which control unwanted light from escaping to the horizon, provide a much-improved nighttime environment by eliminating glare to a much-improved level. In the proposed MAG Pattern Lighting Code (PLC), Section 4, Shielding and Total Outdoor Light Standards, 4.1, *Notes to Table 4.1*, this topic is addressed in paragraph 1 when discussing Spot and flood lamps. Shielding is also addressed in this same section of *Notes*, in paragraph 4.

Granted, as discussed in an earlier meeting, shielding is not going to completely prevent light glare and light trespass because light is reflected from the inside of the shield itself to cause some minimal amount of glare. However, as displayed in the dramatic 'before and after' photos of an athletic field in Flagstaff, there is a huge improvement in reduction of glare and light trespass by the addition of external shielding on outdoor light fixtures. This improvement over the normal method of lighting should not be ignored.

There has been discussion in this panel by parties concerned with prohibitive expenses of retrofitting fixtures to a higher standard of shielding than full cut-off. This should not become an issue of concern because only new lighting fixtures or replacement lighting fixtures would be required to meet the required higher degree of shielding. No retrofitting would be required unless chosen so by individual municipalities.

What would constitute an appropriate degree of shielding? From talking to unbiased members of the public, all that is heard is to have the lights shielded to eliminate glare! An angle of 45 degrees is stated in MAG PLC, Section 4, for the positioning of outdoor spot and flood lamps, but perhaps that is too severe for most outdoor lighting requirements. Yet, perhaps not, since most full cut-off

fixtures with interior shielding direct the major portion of the light to a relative small area at ground level and rely on indirect light to illuminate the surrounding area. An external shield which controls light at 55 to 65 degrees from the vertical should be sufficient and should be considered by this panel for major outdoor lighting fixtures.

As a representative on this panel from the public sector, I urge this panel to heed the voice of the citizens of Maricopa County by seriously considering adopting language that addresses aggressive shielded light standards in the proposed MAG Pattern Lighting Code. To the citizenry, it appears that shielding is more important than lumens/acre, height, type of luminaire, etc.

Thank you for your consideration of this matter.

Best regards,
James S. Truman
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Waddell, Arizona