Maricopa Association of Governments

MAG Pattern Lighting Code

version 1: April 27, 2009

Critical Points

Sections 4, 5 and 6 contained the meat of the code. Each of these sections should be carefully reviewed. We point out some critical issues below; each jurisdiction may identify others.

Section 4.2 Total Outdoor Light Output Standards

Two topics are critical here: the possibility of designating lighting zones, and establishing overall lighting limits through lumens per acre caps.

Establishing lighting zones is a relatively less important suggestion, though it might be advisable to consider greater protection for residential areas to preserve a more natural night time living environment than might be appropriate for more heavily developed areas. It does complicate the code by the creation of the zones and by adding more standards, but not very much.

Establishment of lighting caps through lumens per acre caps is a new (for MAG jurisdictions) yet critical component. The value suggested for LZ 2 (150,000 lm per acre) is 50% greater than a value which has caused very little controversy in Flagstaff, Coconino County, Cottonwood and Sedona (among many jurisdictions with lumens per acre caps), all of which use 100,000 lm per acre as their only or maximum amount. You may wish to consult with the Planning Directors of these communities as you consider the standard:

- Coconino County: William Towler, FAICP, Community Development Director, 928-679-8850
- Cottonwood: George Gehlert, Community Development Director, 928-634-5505
- Flagstaff: Jim Cronk, Planning Director, Planning and Development Services Section, 928-779-7631 extension 723
- Sedona: John O'Brien, Director of Community Development, 928-204-7123; Audrey Julin, Assistant Director of Community Development, 928-204-7107

Section 4.3 Lamp Type Standards

The use of the yellows light sources HPS and LPS is suggested for Class 2 lighting (which amounts to usually more than 80% of outdoor lighting in nonresidential properties. Such lighting is not only generally more efficient (using less energy for a given amount of light), it also produces both less visible pollution (for casual sky observers) as well as less light pollution for astronomical observation. Note that we do not suggest a "strong" LPS requirement, only allow it as one of two types listed for high output lamps used for general lighting. The intention is to disallow "white" lighting sources such as metal halide and new white "LED" systems that are being heavily marketed in recent years and which have been shown to produce three to five times more visible light pollution than HPS lighting.

Section 5.2 A. Internally Illuminated Sign and Neon Sign Standards

Since it is impractical for site inspectors or code enforcement personnel to verify how many and what kind of lamps are installed inside closed cabinet signs, limiting the glare and light pollution from these requires a more practical approach, as suggested here. However, this may be your jurisdiction's first foray into limiting design/color characteristics of signage. Studies however have shown that for every unit of light pollution produced by a light-background sign, colored-background signs produce about 0.15 units (15%) and opaque-background signs produce about 0.07 units (7%). Such signs are generally much more legible than their brighter counterparts, particularly for older people. National franchises have shown in every case known the ability to adapt to these standards, even when their "standard" sign style includes a white or light-colored background.

Thought must be given to coordinating any sign standards contained within a lighting code with the sign code of the jurisdiction.

Section 5.3 Billboard Standards

To consider:

- Is the definition for Billboard correct (see section 16)?
- Subsection B: Lighting limits are designed to allow industry standard recommended illumination levels for Billboard sign faces.
- We are unaware of any effective way to practically address the amount of light produced by LED billboards. Since such billboards are difficult to regulate in other ways (such as the frequency of copy changes) we suggest disallowing them. This may not be a desired or politically practical approach for some jurisdictions.

Section 6 Special Uses

To consider:

The number of special uses should be kept to the minimum necessary to address important (high impact or potential impact) uses not adequately addressed through other sections. Some require technical/professional design, and as such intentionally impose on the developer a requirement for professional lighting design and certification, though the incremental cost for these high-expense projects should be relatively small. One of the principal reasons for requiring outside certification is to avoid generating the need to maintain highly technical lighting expertise on staff.

Subsection 6.1, Sports Lighting is critical, as studies have shown that sports lighting, one on, can increase the light pollution over a city by as much as 50% when using the older technologies which dominate such installations. Huge improvements in reduced light pollution and energy use are available through newer fully or nearly fully shielded technologies and by (in many cases) lowering the lighting levels to the industry recommended levels.

Subsections 6.2, Outdoor Display Lots and 6.3 Service Station Canopies are likewise critical because of the increasingly over lighted practices seen in these highly competitive applications. Lighting levels in excess of 20 times the professionally recommended levels are commonly seen.