

# Shoebox Metric: A Framework for Reducing Light Pollution

Increased levels of nighttime lighting outdoors and greater public awareness about light pollution issues are prompting calls for reductions in outdoor lighting. However, differing ideas about how best to reduce light pollution are creating controversy over outdoor lighting. Inadequate metrics and measurement methods are part of the problem, so the LRC is developing a comprehensive framework called the “shoebox metric.” This metric will provide a means of identifying how much light is leaving a lighting installation and will quantify light pollution.

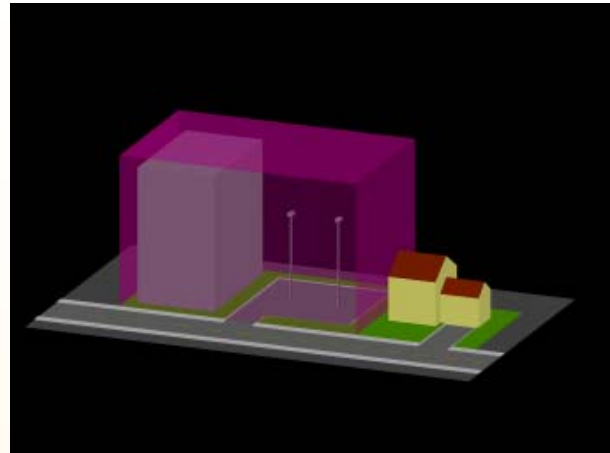
## Metric design

The concept is to create a shoebox-shaped area around a property. The planes of the shoebox will represent measurement and calculation planes. The amount of light allowed onto each plane or onto a given section of each plane will vary, depending on the type of area or neighborhood involved. The shoebox metric allows planning authorities to set measurable limits on the amount of light leaving the shoebox on one or more planes. It also allows property owners some flexibility in their lighting decisions, while holding them accountable for those decisions.



An example of light trespass.

Source: David Fernández-Barba,  
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The shoebox metric:

- Applies to individual applications
- Addresses light trespass and the installation's contribution to skyglow
- Is flexible enough to be used anywhere, so it can be widely adopted
- Allows prediction of regulation compliance during an installation's design stage
- Allows easy measurement procedures to verify compliance
- Complements large-scale planning guidelines such as lighting power density limits and environmental zones
- Is simple to understand and easy to apply
- Is outcome-based, not equipment-based

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