

Putting Light Where it Matters

THE CRITICAL ROLE OF TARGET EFFICIENCY



WHAT IS TARGET EFFICIENCY?

Target efficiency is a metric for evaluating how much light hits its intended target relative to the total light output as well as how uniform that light is distributed. For exterior lighting, the target area could be a roadway, walkway, pathway, parking lot, sign, building facade, or any other defined exterior space.

Why is it important?

The higher a luminaire's target efficiency, the less light is wasted in areas where light isn't needed. Higher Target Efficiency Means:

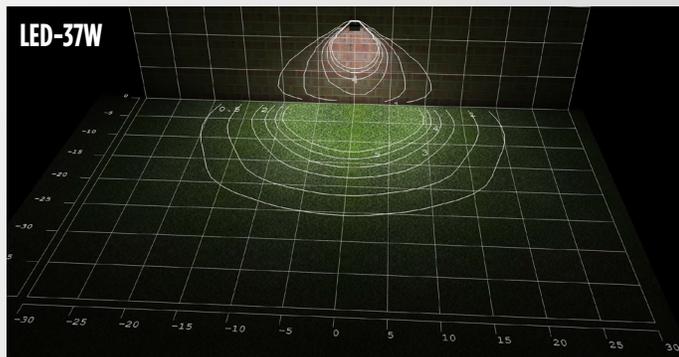
- Less lumen output and energy consumption without sacrificing light levels and light uniformity.
- Reduced upfront costs.
- Lower lifecycle costs.
- Less spill light and light trespass reducing environmental impact.

What is spill light or light trespass?

Spill light (light trespass) is unwanted light spilling into areas where it isn't needed, often from poorly aimed or overly bright fixtures causing light pollution, disrupting privacy and wildlife.

Building Mounted Luminaire Example

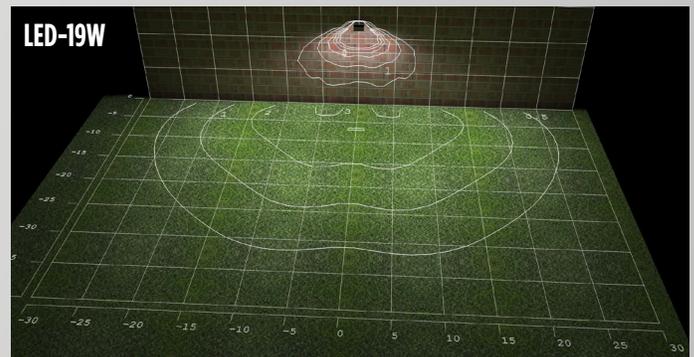
Low Target Efficiency



Wattage	Initial Lumens	Target Efficiency	Lumens on Target	Uniformity
37w	4,267	70%	3,008	Low

* Target area is 60" x 30" along building perimeter

High Target Efficiency



Wattage	Initial Lumens	Target Efficiency	Lumens on Target	Uniformity
19w	2,957	85%	2,568	High

* Target area is 60" x 30" along building perimeter

High target efficiency is achieved by:

- Utilizing precision optics that shape and direct light effectively.
- Minimizing backlight and uplight to reduce wasted energy.
- Evenly distributing light to eliminate hotspots and dark areas.
- Properly designing shields to restrict light to only where needed.

How to Specify High Target Efficiency:

- Limit backlight of asymmetric distributions to less than 20%.
- Require that a high percentage (85%+) of light must be contained within the target area or site.
- Restrict luminaires to fix mounting to avoid inefficient fixture tilt.
- Specify luminaires with IES distribution patterns (the more types and variation the better) and integral shielding (no external shields).
- Require a photometric layout on all projects (new or retrofit).

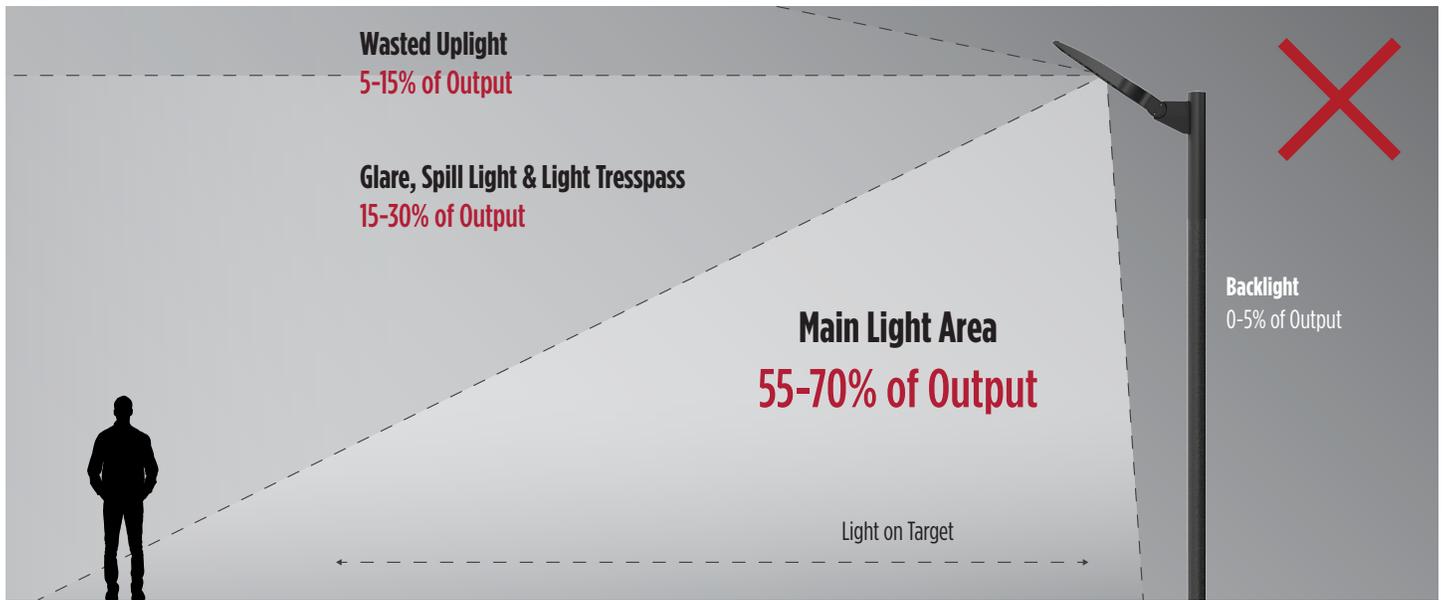
What About Luminaire Tilt?

Utilizing luminaires with adjustable arms is often seen as a way to improve target efficiency and reduce upfront project costs. However, the effects are almost always negative.

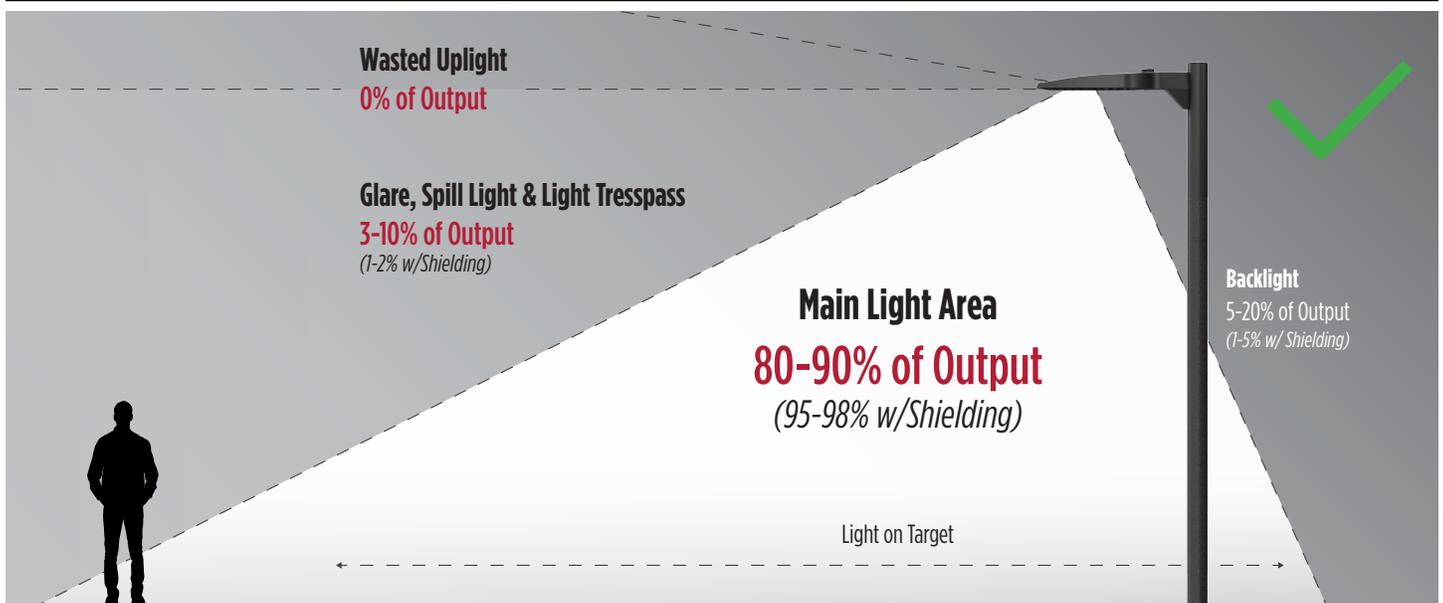
Tilting luminaires increases the amount of wasted uplight, spill light/light trespass, and glare while actually reducing the target efficiency.

In fact, when significant tilt is utilized (greater than 30° above horizontal) the target efficiency drops so drastically that the lumen output of the luminaire has to be increased by several factors to compensate for the reductions in target efficiency. Higher lumen outputs then lead to increased glare which reduces visibility, making the site less safe for users. Higher lumen outputs also then lead to higher luminaire costs and energy consumption, leading to increases in project costs (both upfront and long term).

Low Target Efficiency Luminaire With 10-30° Tilt



High Target Efficiency Luminaire With Fixed Mounting



Utilizing fixed mounting greatly reduces uplight, spill light/light trespass, and glare while increasing light on target, ultimately reducing costs. Luminaires with high target efficiency distribute light evenly over a targeted area without the need for tilt.



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