

# ASSIST recommends...

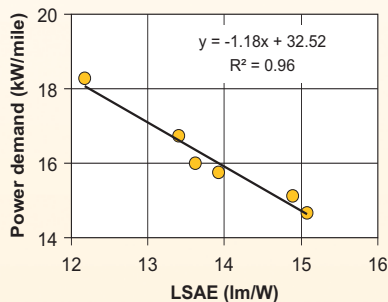
## Recommendations for Evaluating Street and Roadway Luminaires

The availability of new light source technologies for lighting streets and roadways, as well as a growing interest in energy and cost savings, has prompted many cities and towns to consider LED lighting for their communities.



In 2009, ASSIST (Alliance for Solid-State Illumination Systems and Technologies) published an alternative method for evaluating outdoor luminaires designed for parking lots. The metric, called luminaire system application efficacy (LSAE), is based on the concept of application efficacy in which efficacy is measured by the amount of luminous flux reaching the task plane that meets the application's photometric requirements rather than all the lumens exiting the luminaire. For the LSAE metric, this meant counting the lumens reaching the application (e.g., parking lot ground) that conformed to recommended guidelines, and discounting everything falling outside the application

area or not conforming to photometric requirements. Now, a new volume of ASSIST recommends extends the parking lot LSAE metric to street and roadway luminaires.



Power demand for six commercial streetlights along a one-mile length of collector road that meets RP-08-00 as a function of LSAE.

### Evaluating Energy Usage in Street Lighting

As with the parking lot metric, the LSAE metric for street and roadway lights allows for all light source technologies to be compared on the same basis. The requirements for illuminance, luminance, uniformity and glare correspond to those recommended in RP-08-00, the IES's American National Standard Practice for Roadway Lighting; however, other preset criteria could be substituted.

Sample	Mounting height (ft)	Pole spacing (ft)	Input power (W)	LSAE (lm/W)	# poles per mile	Power demand (kW/mile)
1	30	135	204	13.9	77	15.8
2	30	120	174	14.9	87	15.1
3	25	90	144	13.4	116	16.8
4	35	215	305	15.1	48	14.7
5	40	190	293	13.6	55	16.0
6	40	165	290	12.2	63	18.3

Streetlight characteristics and LSAE results for six commercially available streetlights used to light a one-mile length of collector road to RP-08-00 lighting criteria.

The calculation involves defining the task plane (i.e., a segment of the roadway area), setting the pole spacing and luminaire mounting height, determining the criteria for the given application (based on the roadway type and pavement classification), and then deriving the luminous flux in each cell of a grid placed over the task plane from calculated illuminance values. Cells with illuminance values outside the pre-determined criteria are not included in the final efficacy calculation.

In general, LSAE provides a good correlation to lighting power density and can be used to rank order individual luminaires.

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