

Middletown CT Main Street Lighting Evaluation

Naomi Johnson Miller, FIES, IALD, LC
Naomi Miller Lighting Design
Troy, NY

Goals of street lighting:

- Help drivers see to drive safely:
 - ◆ Stay on the roadway
 - ◆ Stay within the lanes
 - ◆ Avoiding other vehicles and barriers
- Help drivers see obstacles, people, animals, road hazards (incl. potholes), signs
- Supplement visibility provided by headlights

Goals of street lighting :

- Help *pedestrians* see and avoid danger. Help them feel safe.
 - ◆ See potentially dangerous traffic
 - ◆ See potentially dangerous people
 - ◆ Identify places of refuge
- Help the pedestrian in way-finding (seeing signage, pathways and destinations)
- Help the pedestrian and driver see and appreciate the beauty of the landscape or the buildings

Other street lighting criteria:

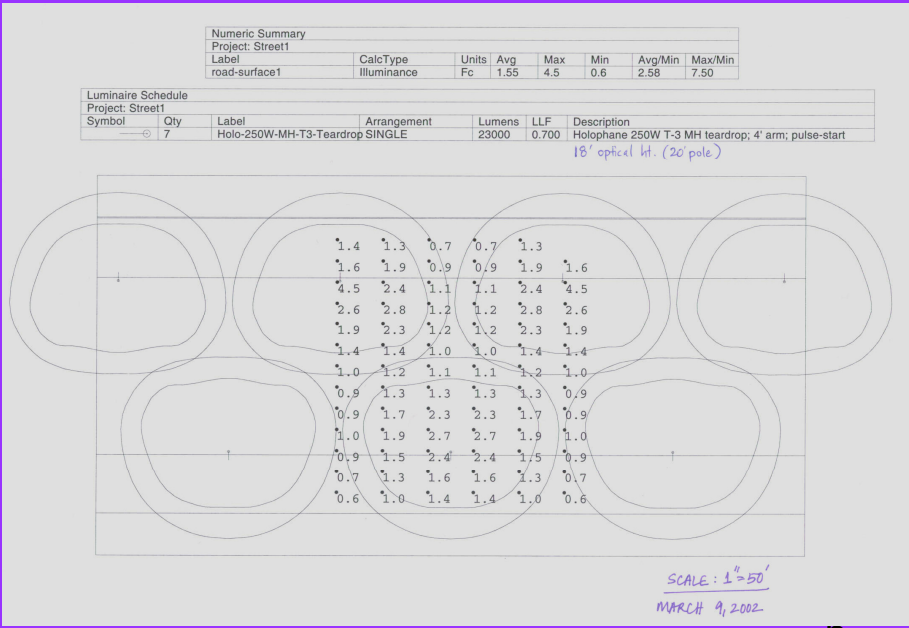
- Minimize **glare** for the driver, pedestrian
- Minimize **light pollution**
- Minimize **light trespass** onto neighboring properties, into neighboring eyes
- Improve the **appearance** of street using attractive products
- **Use energy responsibly** (put light only where it is doing some good, and only as much as needed, *when* it is needed)
- Use durable products that are **easy to maintain**

Evaluation

- Performed computer lighting calculations on existing and proposed product type
- Compared performance against IESNA recommendations
- Looked at recent research into visibility under MH vs HPS at low light levels
- Checked appearance, construction, and optics of proposed “tear-drop” street light products

Evaluation

- Performed computer lighting calculations on existing and proposed teardrop layout

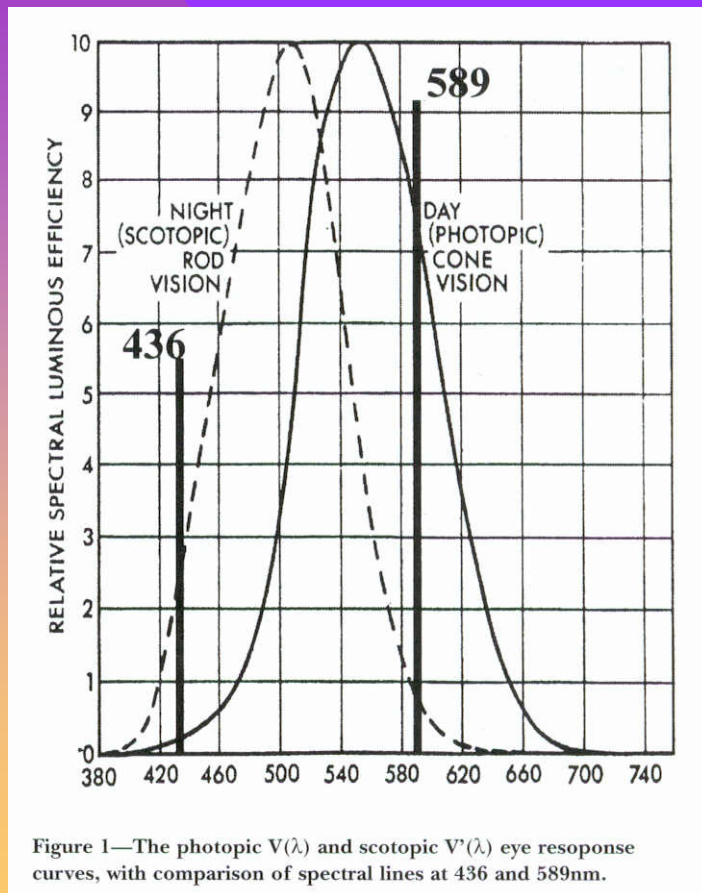


Evaluation

Compared performance against IESNA recommendations

- RP-8-00 Roadway Lighting standards
- “Major” roadway, R3 asphalt pavement
 - High traffic 1.7 fc (min. maint. avgs)
 - Medium traffic 1.3 fc
 - Low traffic 0.9 fc
 - Avg/Min uniformity 3:1 or lower
- Walkways (“High pedestrian conflict”)
 - Mixed vehicle & pedestrian 2.0 fc
 - Pedestrian only 1.0 fc

Evaluation



- Looked at recent research into visibility under MH vs HPS at low light levels
- Human eye more sensitive to blue-rich light at night, so metal halide
 - ◆ looks brighter
 - ◆ improves reaction time up to 1.4 times, compared to equal lumens of HPS
 - ◆ light patterns look more uniform

Evaluation

- Checked appearance, construction, and optics of proposed “tear-drop” street light products
- Strongly recommend “Pulse-start” metal halide for better color consistency, longer life, higher light output over life.

Definitions

Full cutoff: 0 candelas emitted at 90° or above, and candelas can't exceed 10% of lamp lumens at 80° above nadir.

Cutoff: Candelas emitted at 90° or above can't exceed 2.5% of lamp lumens, and candelas can't exceed 10% of lamp lumens at 80° above nadir.

Semi-cutoff: Candelas emitted at 90° or above can't exceed 5% of lamp lumens, and candelas can't exceed 20% of lamp lumens at 80° above nadir.

Non-cutoff: No candela limitations.



12/1/2011



11

In Summary

- Designers/Engineers need:
 - ◆ Better photometric distribution reporting from manufacturers
 - ◆ New understanding and metrics to define perceived glare and light trespass from outdoor luminaires
 - ◆ More products that control glare, have optics to limit light trespass, and limit upward light. (And, can they look good, too, please?)