

## Street lighting Walk-about 2014: Pedestrian Friendly Street Lighting

General issues: Light trespass, Dark Sky friendly, **Glare** is a major problem. Disability glare reduces visibility and increases with age (doubled by 70, tripled by 83). We don't necessarily need more light, we need **BETTER LIGHT**. Show glare examples.

Chautauqua street lighting:

- Mostly owned by National Grid - many > 60 years old (67 metal pan with 80 Watt bulb).
- Post top and cobra head lights – mercury vapor bulbs are no longer available and when they fail, entire fixture needs to be replaced. Over 150 in Chautauqua.
- National Grid wants to use high pressure sodium (orange color), or very bright metal halide bulbs (coach light in front of Bratton theater, acorn lights at main gate and elsewhere).
- Cobra heads are not appropriate for Chautauqua's early 20<sup>th</sup> century ambiance.
- Glare is a problem with all of the National Grid choices – no LED lights available.

Institution Owned lighting:

- Globe lights on concrete poles - Bestor Plaza, Vincent Brick Walk, behind Amp.
- Attractive appearance and have been part of Chautauqua for more than 70 years. Not original lighting – 3 other types of lights preceded the globes.
- Inadequate light, not dark sky compliant, glare in pedestrians eyes – visibility of the ground in front of you is reduced, especially a problem on the uneven brick walks.

Chautauqua Demonstration Lights during 2013 season. Three types of LED lights chosen for comparison with 2012 season demo light (Demo 1). Color temperature 3000K.

- Terson – square array of 49 LEDs (7x7 pattern). Taken down - great deal of glare!!
- Providence LED – circular array of 32 LEDs (16 pairs) each with its own lens. Glare!!!
- Neri LED – Philips linear array of LEDs using reflectors. Selected for use. See below.

**Demo 1** – Providence Indirect with 60 Watt metal halide bulb (dims to 45 Watts during night).

Output 6500 Lumens - reduced to about 4000 by reflector. Predicted life 15 – 20K hours (3.5-5 years)

- Pleasing color similar to incandescent bulbs, provides light output = other 100 Watt bulbs.
- Type 3 light distribution (light in front and to the sides but minimal light behind – light does not shine in windows or on porches).
- Minimal glare (you can look directly at light without being blinded).
- 2012 survey had 331 responses with 86% approval (68% strongly, 18% approve)
- Open light housing – issues with bugs in mid Summer.
- Does not use newer LED technology

**Demo 2** – Neri 804 Heritage – Philips Fortimo LLM linear LED array. 37 Watts with dimming capability. Output 3000 Lumens. Predicted life > 70K hours (17 years)

- Uses reflectors with the light source in the center (similar to incandescent or halide lights)
- Very low Wattage, yet light output is adequate for Chautauqua
- Type 3 distribution
- Moderate glare. Frosted lens reduced glare somewhat but not enough
- Dimmer inserted and reduced the output to 60%: Now 1800 lumens and 24 Watts.
- Excellent compromise between glare and needed light output.
- Fortimo 24 Watt module is available – no need for dimmer.
- Chosen to be the preferred luminaire for use in Chautauqua.
- Use 24 Watt Fortimo module for post-top mounting at 12 feet, 37 Watt for mounting on arms at greater height on wooden utility poles.
- New lights are installed at the rain garden on Upper Root Ave behind Norton Hall (July 2014)