

Municipal Solid-State  
**STREET LIGHTING**  
**CONSORTIUM**  
Sponsored by the U.S. Department of Energy



# The Light Post

Official MSSLC e-Newsletter

October 2014

## In this issue:

[From the Director](#)

[MSSLC Street and Area Lighting Inventory](#)

[Report from the I-35W Bridge Installation](#)

[2014 Street and Area Lighting Conference](#)

[Duke Energy Moving to Replace 100K Mercury Vapor Fixtures](#)

[Washington State Launches Initiative to Replace All Public Lighting](#)

[Independence, MO - the Rest of the Story](#)

[Highways Administration Lighting Handbook Workshop](#)

## From the Director

Happy New Fiscal Year! For those of us who are either public employees or supported by public funding, October 1 means new budgets, and often modifications in scope. In line with this annual "celebration," this year the MSSLC is expanding its focus. Anyone who attended the recent [IES 2014 Street and Area Lighting Conference](#) through to the end heard me speak about this already.

By now, most of our current MSSLC members are leaps and bounds up the learning curve of LED street and area lighting, and many have even embarked on replacing some or all of their systems. We like to feel not only that the MSSLC has contributed something to this situation, but also that we're continuing to add to it. As the lighting community evolves into high-performance technology, we regularly review our efforts to determine where they can continue having the greatest impact.

In the last *Light Post* issue, I briefly described the High-Performance Outdoor Lighting Accelerator, or HPOLA (see more program detail in the [HPOLA Fact Sheet](#) on the DOE website). The MSSLC and HPOLA are very complementary, both being designed to provide technical assistance to street and area lighting owners interested in pursuing an upgrade to high-performance lighting. Unlike the MSSLC, however, HPOLA goes a step further by asking members to make a *commitment* to retrofitting some portion of their lights, on the order of 50% or more, over the ensuing one- to two-year period.

During the fiscal year that began October 1, the MSSLC is expanding its emphasis to include support for the needs of HPOLA partners. Many municipalities around the country continue to face barriers of one type or another and are thus still waiting to get started in their replacement efforts. One of our first missions will be to help identify what those remaining barriers are and what we can do to help address them. HPOLA is also looking at a broader group of lighting applications – in particular, more exterior area lighting – than the MSSLC has to date. Finally, HPOLA is intended to be technology-neutral; while most interest these days is in LED technology, we'll be potentially increasing our technical support to cover products such as induction and plasma lighting as needed.

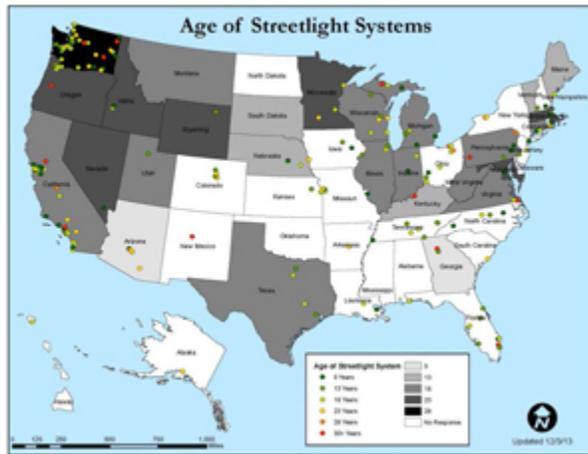
The MSSLC will continue to refine our existing materials and tools as necessary to keep up with the very dynamic environment surrounding street and area lighting. Some of these, such as our luminaire and controls specifications and the financial analysis calculator, may be packaged up and/or modified for use by HPOLA partners. In other cases, we may be developing new information and resources where they are needed. In the end, this won't be tremendously different from what we've been doing all along – just more of it.

Stay tuned!

### **The MSSLC Street and Area Lighting Inventory, Phase I, is Posted!**

During the latter half of 2013, the MSSLC undertook a voluntary web-based [inventory survey](#) of public street and area lighting in the United States. The survey strove to obtain information in a "bottoms-up" manner, going directly to public owners and operators for quantity and source-type information about their street and area lighting systems. The Phase I Report has just been released and presents the results directly reported by survey respondents. A future Phase II effort intends to extrapolate the results obtained in the survey across the entire nation. Overall, inputs from an average of about 240 organizations underlie the results reported in the present inventory, with the precise number of responses varying in the case of individual questions. Respondents represented a broad cross section of public lighting owners and operators, including municipalities, counties, municipally owned utilities, investor-owned utilities, and state DOTs. Interestingly, only about half of the respondents are current members of the MSSLC.

One notable finding of the survey was that 36% of all respondents reported at least some ongoing use of mercury vapor luminaires in their systems (this source technology became popular in street lighting back in the 1930s!). Perhaps just as surprising were the 16 respondents (out of 200 that answered that specific question) reporting that LED products were already the most prominent source technology used in their lighting systems in the latter half of 2013.



The document reports a number of other interesting results as well. It's available for download from the [DOE SSL website](#)

### The Final Report from the I-35W Bridge Installation in Minneapolis is Also Posted!

Most of you probably remember the catastrophic collapse of the I-35W Bridge in Minneapolis in August 2007. In an impressive feat of construction, a new replacement for the bridge opened to the public only 13 months later, in September 2008. Equally impressive was the decision to light the new bridge with LED luminaires, a choice that significantly pushed the envelope at the time. Working with the other agencies involved, the DOE GATEWAY Demonstration Program published an evaluation of the bridge's LED lighting system in 2009 and committed to conducting a follow-up evaluation after a few years of operation. GATEWAY has just released the final report from this project.

Overall, this early-stage installation continues to provide effective lighting for the residents and visitors to Minneapolis/St. Paul. However, the report also details a few issues that were encountered, which were not unexpected given the system's vintage.

It has been interesting to document the results of dirt depreciation, which was assessed at two different times: for two luminaires removed from the field in November 2009 due to a power supply issue in one of them, and for two more that were removed in May 2013 as part of the original testing plan. The corresponding measurements for luminaire dirt depreciation averaged about 4% after ~5,000 hours, increasing to 12% after ~20,300 hours of luminaire operation.

Other contributors to decreasing lumen output were also measured and/or estimated in order to investigate their various levels of impact. After subtracting all other causes, the average reduction in light output due solely to LED lumen depreciation was estimated to be about 10% during the evaluated period of operation.

The full document is available on the [DOE SSL website](#). DOE is also hosting a 60-minute webinar on the results on Tuesday, October 21, at 1:00 p.m. Eastern Time; register [online](#).

## 2014 Street and Area Lighting Conference a Big Success; MSSLC Contributions

Every year, the Street and Area Lighting Conference (SALC, linked above) grows bigger and more impressive, and this year was no exception. Some 822 attendees converged on Nashville last month to hear about and discuss the latest developments related to the topic applications. Controls made a big appearance this year, showing up in at least five different presentations in one form or another, including one entitled "What to look for today in control systems," which was presented in conjunction with the MSSLC by Michael Poplawski of Pacific Northwest National Laboratory (PNNL). This talk was designed to help attendees better understand some key differences in the technology building blocks that comprise market-available outdoor lighting control systems and how those differences relate to system features, value propositions, and potential barriers to deployment.

A second talk given in conjunction with the MSSLC was presented by Michael Royer of PNNL and was entitled "LLD & LED: Choosing the Right Light Loss Factor for LED Street Lighting." Dr. Royer discussed typical design practices related to the lamp lumen depreciation factor (LLD), IES-recommended practices for light loss factors in general for both conventional and LED sources, and possible methods for reconciling these in the future.

These two presentations can be downloaded from the [DOE SSL website](#). Be sure to follow the IES website for information and updates related to SALC 2015, scheduled for early October in Savannah, GA.

## Duke Energy Moving to Replace 100K Mercury Vapor Fixtures in North Carolina

Emily Henson, Duke Energy's Director for Outdoor Lighting, recently emailed us a very complimentary thank-you note for the assistance the MSSLC provided in helping Duke Energy prepare for an upcoming modernization of its street lighting system. The note was accompanied by a press release announcing that the utility had received approval from the North Carolina Utilities Commission to replace more than 100,000 mercury vapor street and area lights with LED luminaires. What's more, Duke Energy now has its sights set on a similar effort in South Carolina. Congratulations to Duke Energy for taking this important step forward! See the [news release](#).

## Washington State Launches Initiative to Replace All Public Lighting with LED

Governor Jay Inslee of Washington State recently signed [Executive Order 14-04](#), "Washington Carbon Pollution Reduction and Clean Energy Action," which includes, among various other measures, a directive to "upgrade the energy efficiency of all street lighting within the state." While a specific date of completion has not yet been announced, the MSSLC has been in communication with the Washington State Energy Office and the Washington State Transportation Improvement Board to help with planning this effort. In a timely coincidence, the state was able to use some of the information derived from the MSSLC Street Lighting Inventory to help estimate how many public lights are located there. The various agencies directed under this executive order are to provide annual progress reports to the governor, beginning November 2014.

## Independence, MO – the Rest of the Story

The *Light Post* first reported on the Independence, MO, effort to upgrade its streetlights last year (Vol 2, Number 6 – July, 2013). That issue of the newsletter is posted [here](#). Independence Power & Light (IPL) has since completed the upgrade and recently provided us with the "rest of the story."

The project was originally conceived with three main objectives:

- The installation and removal of the streetlights, and managing the inventory;
- The dismantling, recycling, and disposal of the components of the existing high-intensity discharge (HID) fixtures and other project material;
- The collection of GPS and installation/removal data for existing and new facilities, and its input into IPL's GIS system.

Although the installation and change-out of the fixtures visually overshadowed the recycling and data collection, all objectives were equally important. In fact, in the end the latter two activities resulted in the most time spent, due to issues that seemed to arise on a daily basis. Responses to these issues were often needed quickly but also begged for careful consideration, as any decisions would be lasting and could impact the rest of the project. Issues were weighed independently as well as in the context of the overall project, to ensure that the best results were obtained from both perspectives.

Contractor issues, manufacturer issues, and facility issues soon took priority for IPL's project management team. These issues included effective management of the needed inventory, dealing with maintenance and returns, optimal scheduling, questions of ownership, matching luminaires to their intended locations of installation, questions concerning proper recycling or disposal of the older fixtures, and many others. A day-by-day task list and specific direction were needed until a rhythm could be developed to carry through to the end of the project.

As time progressed and the crews gained familiarity, lights were changed out at an increasing rate. Before long, the contractor's recycling and disposal group became overwhelmed by the growing volume, revealing that more attention was needed on this objective. IPL had stressed to the contractor that appropriate recycling of old and potentially toxic materials was a major goal of the project; the scale of the effort meant that nearly 12,000 old fixtures would need recycling or proper disposal. Revisiting this objective, the contractor developed an entirely new system to complete this task, while ensuring that all parts were treated with care through proper dismantling and sorting. The contractor even brought in additional subcontractors, appropriately recycling the glass, housings, ballasts, bulbs, and other components. This process was completed shortly after the last LED luminaire was installed.

IPL deems effective data collection crucial for purposes of recordkeeping, accounting, facility management, and lighting maintenance. During installation, a unique identifying tag was installed on each luminaire that allowed it to be individually tracked. As part of project management, IPL put a project completion map on the city's website and regularly uploaded it with completed data, so that residents could view and track progress. The contractor had been using a unique way of combining the data collection with post-installation inspection, a process that offered both benefits and disadvantages. Most importantly, as the rate of change-outs increased,

the data collection began to fall behind. Once again, stressing this to the contractor as a major component of the effort underscored its value. The contractor re-examined its methods, purchased more equipment, and increased staff on the data collection side. The record collection rate was doubled and eventually brought the map back up to date. Ultimately, even though data issues were still being addressed for some time after the last light was changed out, the contractor had committed to providing a completed project and held to this commitment. The internal data systems at IPL now possess accurate location and equipment data that should contribute to the operation and maintenance of the city's streetlights for years to come.

As a result of this project, the City of Independence is one of the first in the nation to complete an ambitious full-scale streetlight replacement. The program aligns with the city's goals of developing and supporting vibrant neighborhoods and a high quality of life, while contributing to the long-term financial stability of the city and encouraging energy efficiency and green energy initiatives. In the end, residents of Independence and the surrounding metropolitan area see the city in a whole new light.

A few notable benefits of the conversion:

- More than 5 million kilowatt-hours of energy savings per year, worth nearly \$300,000;
- An estimated \$150,000 savings in maintenance costs each year;
- Annual reductions in greenhouse gas emissions of more than 10 million lbs.;
- Improved quality of white light;
- Increased luminaire life.

### **Federal Highways Administration Lighting Handbook Workshop Offered**

The FHWA is offering an 8-hour workshop on the new *FHWA Roadway Lighting Handbook*. The purpose of the workshop is for participants to learn about roadway lighting design and the requirements from the new handbook. Presentations and discussion will focus on the impact of new LED lighting technology; lighting design standards from FHWA, AASHTO, and IES; warranting and the impact of lighting on roadway safety; and innovative approaches to roadway lighting design. Presenters will include Dr. Ronald Gibbons of Virginia Tech Transportation Institute, Paul Lutkevich of Parsons Brinckerhoff, and Don McLean of DMD and Associates. Date and location options:

- Saratoga Springs, NY - October 20/21, 2014 (New York DOT)
- Phoenix, AZ - October 28/29, 2014 (Arizona DOT)
- Olympia, WA - November 19/20, 2014 (Washington DOT)
- Atlanta - January 20/21, 2015 (Georgia DOT)

#### [FHWA Lighting Handbook Workshop Registration](#)

For Questions, Contact:

Joseph Cheung

FHWA Office of Safety

202-366-6994

[Joseph.Cheung@dot.gov](mailto:Joseph.Cheung@dot.gov)