In a New Light

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The streets of Los Angeles are looking a lot brighter; you're not seeing things. Well, actually, you are – you're seeing the results of one of LA's most successful recent programs, replacing all of the high-pressure sodium orange lighting (previously  technology) with super-bright and efficient LED bulbs. If you look up at the City's more than 140,000 lighting fixtures (just don't stare too long, you'll see that most have been replaced with the sleek, white-light LEDs.)

Led by Director and Citywide Public Works and Assistant Director, Street Lighting and CCI Member, “It is a shining example of how green technology can be both environmentally responsible and cost-effective.”

“With the LED program, we have transformed the night landscape of the City of Los Angeles, made our City safer and pedestrian-friendly at night, and have exceeded our initial program goals on both energy efficiency and CO2 reductions. Angelenos have embraced the new white LED light, as we have received many positive comments from citizens, community groups, the LAPD, and even the LA Skies Association for the reduced sky glow at night, reduced light pollution and trespass.

“We have gained national and international acclaim by leading the way with our LED program, which has become a model program and example for a lot of cities as we continue to get recognition and inquiries from municipalities and utilities around the world.”

History

In September 2009, Public Works/Street Lighting began implementing the LED program, which replaced 140,000 existing street lights with the far more efficient LED units. The program was initiated to allow street lighting to continue delivering street lighting services:

- To reduce the City's costs in both energy and maintenance, and
- To reduce the City's carbon footprint by reducing the use of electricity.

The retrofit program was to span five years, but at the instruction of Mayor Antonio Villaraigosa, Public Works began an acceleration so as to complete the conversion of the 140,000 lights by June 2013. This cut one year from the schedule, making the original five-year program a four-year program.

Response from the community and law enforcement has been extremely positive.

This program and its results have made the City of Los Angeles a model for other cities around the globe that are interested in emulating the City's retrofit methods. Public Works receives many phone calls and e-mails from municipalities seeking guidance and information.

Public Works reports that the actual number of fixtures retrofitted is more than 135,000.

Phase Two

As a part of the budget process for the next fiscal year, Street Lighting has put together a package to address decorative fixtures and other special lighting in the City that will require intensive design and research because of the sheer volume and diversity of the lighting equipment in the City of Los Angeles. That work is beginning now.

For more information, see the rest of this feature story, or go to:

www.ts1.city.org/ded.html
That's a Winner

Public Works/Street Lighting’s LED retrofit project has gained national and international acclaim and has become a model for cities and utilities across the world. It has been recognized by a number of different groups, including:

U.S. Department of Energy
Harvard Kennedy School’s “Bright Ideas for Innovations in Government”
Conference of U.S. Mayors’ “Climate Protection Award”
LUCI Association “Best Initiative in Sustainable Urban Lighting”
Forbes, and numerous engineering and lighting publications.
**THE ALIVE! INTERVIEW**

**Innovation Burns Bright**

On a recent afternoon, the CEO of Street Lighting, Jim Quiley, street lighting engineer and manager of the LED replacement project for the City of Los Angeles, sat down withAlive! to discuss the project and its impact on the city.

**On May 7, Robert Laros, Club Vice President of Operations, interviewed Jim Quiley, Street Lighting Engineer and manager of the LED replacement project.** Public Works/Street Lighting, 21 years of City service, Club Member. The interview took place in Street Lighting’s conference room in its downtown headquarters.

**Alive!** Hi Jim, what’s your history with the City?

**JIM QUILEY:** Well, I’ve been working for the Bureau of Street Lighting for 21 years, and one of the neat experiments thing is that you get to transfer to the Department of Transportation and then work with the city’s transportation engineers. And after that, I was familiar with every facet of our operations. I took advantage of that opportunity and it’s been great.

**JIM:** I have a master’s degree in electrical engineering, before coming to the City I spent about five years working in construction doing electrical work.

**So when the LED retrofit project manager opened up, I was fortunate enough to be selected for this. Finally, the opportunity to do this, live, travel and then install and maintain the performance of the cutting-edge technology is a dream job for an engineer. And I consider myself very fortunate to have this opportunity and it’s been great so far.

**Are you sticking with this through Phase Two?**

**JIM:** Absolutely.

**About the Project**

**Describe your roles and responsibilities with the LED bulb replacement project.**

**JIM:** Sure. The LED replacement program is under the purview of the New Technologies and Energy Efficiency Division, the division that I manage. It incorporates all of the LED technology and responsibility for – one is the testing and evaluation of new LED equipment, and the second is the LED replacement plan.

**Almost like mapping?**

**JIM:** It’s like mapping, but it’s a lot more complicated than that because we’ve got to keep track of the energy that was used by the previous equipment, the new energy load on the wires, all of that sort of stuff. It covers a huge area, approximately 400 square miles.

**The replacement plan is an opportunity for us to get through and update our geographical information system so that it accurately is always going to be good system but now it’s**

**an excellent opportunity to double-check and correct any errors that are there. The Bureau of Street Lighting is constantly adding equipment through private developments, even pole knockdowns have an impact, so it’s a good opportunity for us to update all of our information.**

**What is this project all about?**

**JIM:** The project is actually two phases. The first phase is focused on replacing all of the pole-mounted fixtures with the appropriate LED fixtures. The second phase involves the installation of LED retrofits in new buildings.

**That was high-pressure sodium.**

**JIM:** Right, that was the majority, but there was also a lot of mercury vapor out there and some other strange stuff from way back.

**It was good technology when it came out.**

**JIM:** Exactly, it was very, very efficient compared to incandescent bulbs, and stuff like that, but the technology is 60 years old or so, and so it’s high time. It was replaced.

**Technology is advancing at a very rapid rate and street lighting reflects that.**

**JIM:** That is true.

**Phase Two**

**So that’s Phase One. You’re moving into Phase Two.**

**JIM:** For all intents and purposes we’ve just launched Phase Two, which we did in June of this year, which we’ve been doing some work that’s over and above the initial 140,000 streetlights we’ve replaced so far. Of the approximately 140,000 that’s an incredible margin.

**The second phase is more complicated and includes some of the project’s most important work.**

**You’re focusing on the more decorative fixtures now.**

**JIM:** Yes. It’s going to be a lot more labor intensive because there are many different styles of equipment out there. A lot of it is very beautiful, and some of it is quite old, so we have to be super careful to replace the bulb so that not only are we improving the efficiency of these lighting fixtures but we’re maintaining the historic value of them as well. It’s going to be interesting, it’s going to be a challenge. I’m really excited about it because there are some new ways of retrofitting existing equipment, but this is real new – just within the last few months. It’s going to be a great opportunity.

**In the evaluation lab here we saw the fixture that you’re working on to go in Chinatown.**

**JIM:** Yes, exactly.

**Is there any way to quantify how many types of decorative fixtures are out there?**

**JIM:** I think about 400 special types. There’s a huge variation, some going back to the 1930s.

**Your job has gone from being a macro to a micro.**

**JIM:** That’s an accurate way to look at it. The Bureau of Street Lighting is responsible for somewhere around 21,000 streetlights, and eventually all of these are going to have to be dealt with one way or another. We’ve taken a good first step in this with 140,000 during Phase One, the rest during Phase Two.

**So you’re maybe 60, 65 percent finished, something like that.**

**JIM:** That would be fair to say, in terms of the amount of labor and effort, though, the remaining 35 to 40 percent is going to be much more intricate.

**History and Efficiency**

**Can you give me the history of this?**

**JIM:** Sure. Going back to as early as 2006, our Director, Edbrahimian, began investigating the LED technology for street lighting. At that time the industry was really in its infancy but the potential was huge, and he put together a proof of concept pilot program installing LEDs in various neighborhoods throughout the city, about 200 units in total. The evidence that this small pilot provided gave enough confidence for Ed and Assistant Director Norma Hernandez to invest in the technology. Even though it was still early and it wasn’t exactly what you’d call great – it was nowhere near as good as it is now – it gave them enough confidence to actually put together a five-year program. Ultimately the five-year program was cut to a four-year program by Mayor Villaraigosa, who wanted to have the entire thing completed before he left office. That gave us many challenges because we increased our production by 50 percent. But we managed to meet that goal, and Mayor Villaraigosa went away happy. We were all happy.

**Has anything big been attempted in such a compact amount of time here in Street Lighting?**

**JIM:** At the time we completed Phase One in June 2011 our project was the biggest in the world at quite a reasonable margin. But at some stage someone is going to have a project that’s bigger than this. The equipment continues to improve at a pretty dramatic incline and in a lot of ways some of the people coming later are going to benefit from our efforts and, I think that’s great. It’s drawn a lot of positive attention to the City of Los Angeles and to our director because he had the foresight to take advantage of this technology.

**How has the equipment gotten more efficient, and how have costs come down since you started this project?**

**JIM:** The efficiency is incredible. We started out hoping for about 40 percent savings in energy, and now we’re getting well over 50, and it is showing no signs of decreasing; we’re getting more lumen per watt. It’s spectacular. The efficiency of the LEDs has improved, and costs have come down tremendously. In the neighborhood of 60 percent reduction since we’ve gotten started. If you’re getting an improvement in efficiency of 30 or 40 percent and a reduction in costs of 50 or 60 percent it’s great.
You're working with manufacturers pretty much every day to develop this technology. JAD: That's true. Early on there were many companies just appearing, startup companies bringing equipment made in somebody's garage, and we could tell. A consideration was, who are these manufacturers and are they going to be around by the time their warranty expires? That's one thing we had to take into consideration while we were doing this.

Impacts

Is there any way to describe what your savings are?

JAD: Yes. The results of this retrofit are easily quantifiable, and our team has gone to great lengths to ensure that our data is both accurate and verifiable.

With each replacement we calculate how much energy was being used, how much energy is being used, and a bunch of other data. As of today, we've reduced our energy use by 89 gigawatt hours.

Over a year?

JAD: Yes, exactly. So that's a savings of 89 gigawatt hours, and that's a big number. That represents an annual savings of approximately $8 million at the cost of energy now. Energy costs are going to continue to go up, it's critical for our business to look for ways of reducing costs, and of course this program is an excellent example.

About other impacts. If you look at some of the before and after pictures, you can see an enormous improvement in the color rendition and the brightness. Recognizing faces and colors is much easier under this newer light, and even something like curb addresses – painted addresses on the curb, which are virtually invisible underneath the older high-pressure sodium color light – stand out quite clearly with the LED light. Even police helicopter pilots are saying how much easier it is to see a particular color of a car as they are doing a police chase. Those are some of the advantages not easily quantified as the money or the metric tons of carbon dioxide that are being saved, but it's definitely a quality product improvement.

We did get some data from the LAMP. We've had very positive feedback from them, by the way, and the nighttime crime has gone down. Now much of that is an impact of our program. I'm not sure, but I think we should take some credit for it because it's reduced substantially.

Everyone feels safer in a brighter neighborhood.

JAD: I think you're right.

Have you heard anything from Hollywood studios or studio lighting people saying that they like shooting better because the light's better?

JAD: Well, one of the really interesting things is we converted the Sixth Street Bridge back in 2009 or 2010, and almost immediately these car manufacturers started appearing because the light was different. It gives that super-clear rendition of their cars at night. But if they're trying to do a period piece it's going to be somewhat problematic because it looks different and bright.

Another interesting thing is that incandescent put a lot of heat, but LEDs don't, right?

JAD: Yes, the older technology created a lot of heat, and a lot of heat and grime get baked onto the lens side of these things. You have to assume that your lens is going to depreciate at a certain amount because of dirt. But we're finding with the LEDs that there isn't really any dirt degradation, there isn't rot and snout and dirt getting baked on at night. These LEDs are staying a lot cleaner, and that's really good.

Accolades

Talk about being a national leader and the kind of attention you're getting.

JAD: The program has garnered a lot of attention both nationally and internationally. We got a couple of calls a week from various groups that are wanting to get information on best practices, how did we do it, what worked, what didn't work, what units did we use, and so forth. These latecomers are going to benefit greatly from the tricks that we've learned and the improvement of the equipment.

Ed Evalahlamin is internationally known for this program. He talks to people and gives them ideas about how to make it work.

It puts L.A. in a great light, so to speak.

JAD: I think it does. The attention that it's drawn to our City has been positive. The Climate Change Initiative was one of the sponsors of our program way back in 2009, and the DWP contributed loans to this program.

Household Advice

What advice would you give to residential people about switching from incandescent bulbs? What do you recommend? What should people do?

JAD: That's an interesting question. I have to admit it was just a couple of weeks ago that I purchased my first LED bulb for home because they've been expensive, and quite frankly I was a little put off by the whole CFL, twisty-bulbs.

... the swirly ice cream-shaped bulbs ...

JAD: Right. I wasn't happy with them, so I was a little bit hesitant. But now if you go to home depot or Costco, these new LED bulbs are appearing. I bought my first ones just recently, and I think they were ten bucks apiece. That seems like a lot for a bulb, but they work. One of the really important things to remember with this kind of purchase is to compare the actual lumen output of them. Do an actual lumen output comparison, and just a marketing claim, so you know what you're getting. Find one that gives you the same amount. Look at the lumen output and the color of that bulb.

One thing we can certainly expect is that these things are going to continue to go down in price particularly at the residential level because it's pretty new. The price of these things is going to continue to go down, the lumen output is going to continue to increase, and I think it's really promising. I don't think it's too early now, but last year it was too early to buy them.

Great, thanks for the advice, and thanks for the interview.