

New York Energy \$martSM LED Traffic Signal Program
Roundtable Summary
New York State Energy Research and Development Authority
ICF Consulting
Lighting Research Center
American Council for an Energy Efficient Economy
October 18, 2000

<i>Discussion Topic and Summary</i>
<p>1. Welcome and Introductions <i>Speakers - Rachel Winters, New York State Energy Research and Development Authority (NYSERDA) and Dan Frering, Lighting Research Center (LRC)</i></p> <ul style="list-style-type: none"> ▪ Dan Frering welcomed the attendees and spoke about the logistics of the roundtable. ▪ Rachel Winters opened the session and welcomed the attendees, and introduced Paul Vrabel, John Bullough, and Margaret Suozzo. The speakers introduced themselves and their role on the NYSERDA LED (Light Emitting Diode) Traffic Signal Program. They also discussed logistics for the roundtable and what they hoped would be accomplished.
<p>2. NYS Energy \$martSM Program Overview and Goals <i>Speaker – Paul Vrabel, ICF Consulting</i></p> <ul style="list-style-type: none"> ▪ Paul presented an overview of the program and objectives for the roundtable. ▪ Paul also presented the program goals as: Increase awareness and use of LED traffic signals through education and outreach activities providing unbiased technical, product and performance information to the New York State market. ▪ He asked the group what additional feedback they would like to cover at the roundtable. Participants suggestions included the following: <ul style="list-style-type: none"> – How to use NYSERDA rebates to leverage installations. – Finding out about performance contracting. – Determining the maintenance savings of LEDs. – Learning about different types of products that are available. – Understanding utility rate impacts on LED traffic signals and/or other technologies. ▪ Participants were asked to discuss their experiences with LEDs. The participants noted that LEDs: <ul style="list-style-type: none"> – Have fewer burnouts. – Provide maintenance savings. – Lower overtime costs. – Increase visibility. – LEDs are good to specify for new installations. – High traffic intersections are good for LED pilots. – LEDs have non-monetary benefits such as not having to send people out in the middle of the night to replace lamps. – LEDs reduce liability suit exposure. – Are generally well liked by the public. ▪ Participants were asked what market barriers impede LED installations. Reasons included: <ul style="list-style-type: none"> – Sometimes municipalities do not have accurate inventories of the signals they pay for. They are reluctant to pay to convert to an LED traffic signal if they do not stand to reap the cost-saving benefits. – Flat tariffs are a problem. With current tariffs, installing LEDs won't affect the electric bill, since the tariffs are based on incandescent technology. – Some LED traffic signals are very directional. – Both purchase and installation costs are high. – Ambers and greens are expensive. – Metering is costly. – If there is a flat tariff, metering is costly; Onondaga County chose to install meters at a cost of about \$200 per pole. However despite the high cost, it was cost-effective for the county. – With older LED technology signals, lumen output depreciated more rapidly (e.g. 10-12 years ago). ▪ The participants made the following points about metering and tariffs: <ul style="list-style-type: none"> – Niagara Mohawk Power Corporation (NMPC) so far, is the only utility to respond to the Public Service Commission (PSC) request to address unmetered intersection tariffs. They did so by converting their flat tariff, which was volumetric (per kWh) based on assumed values, for a tariff that is a combination of fixed location charge and volumetric charge.

- John Walter of NMPC stated that he believes that most customers would balk at metering. Flat tariffs are a problem because duty cycles can change and affect energy usage. NMPC has asked customers to verify usage. John added the breakpoint at which the new tariff, which has a fixed location charge, would be less expensive was in the 10-11 signal face range; hence all intersections with fewer than 10-11 signals will cost more per month regardless of the technology chosen.
- The participants discussed successes with and advancements of LEDs and made the following points:
 - LEDs are no longer as sensitive to heat-dependent lumen depreciation, as a result of newer source material - AlInGaP
 - The representative from AMERESCO noted that he had facilitated many installations which have been very successful, and experienced very few problems.
 - Onondaga County has received a very positive public response to the signal brightness and visibility of LED traffic signals; especially arrow signals.
 - Battery backup installations are easier to install due to the lower voltages associated with LEDs.

3. Dispelling Myths and Demonstrating the Benefits of LEDs

Speakers: Margaret Suozzo, American Council for an Energy Efficient Economy (ACEEE) and John Bullough, LRC

- Margaret presented a series of slides demonstrating current installations and results, with a focus on New York State installations. Margaret and John initiated a discussion about various LED traffic signal information sources as well as potential forums at which information the project team develops could be distributed. Participants offered the following:
 - Office of General Services web site: www.ogs.state.ny.us;
 - NYSERDA's web site: www.nyserda.org;
 - Consortium for Energy Efficiency's web site: www.CEEforMT.org;
 - The LRC web site: www.lrc.rpi.edu;
 - Institute of Transportation Engineers (ITE) local meetings, trade magazines, journals;
 - Meetings of the Association of Police Chiefs, as many police departments maintain traffic signals.
 - Outreach to schools since traffic and crossing safety is of interest to schools.

4. Benefits of Participating in the Energy Smart LED Program

Speaker: Paul Vrabel, ICF Consulting (The agenda was manipulated at this point so that Paul could present this topic after lunch)

- Paul briefly reviewed a number of the benefits that the NYSERDA program provides and prompted discussion about additional benefits of LEDs. Participants noted that while technology benefits are fairly well-understood, one of the key challenges to successful installations is initial cost.
- Paul then offered some information on opportunities for financing including NYSERDA's institutional financing program. He handed out an information sheet for the program and provided NYSERDA's web site address: www.nyserda.org
 - Rachel Winters of NYSERDA then briefly discussed potential opportunities to finance LED projects through NYSERDA's Standard Performance Contracting (SPC) program and referred participants to John Ahern at NYSERDA (518-862-1090) for additional information.
- Some discussion ensued about whether financing was a viable option for communities or whether purchase of LED traffic signals needed to come out of capital budgets only. Most participants concurred that financing can help to make LED projects happen.

5. Case Studies and Demonstration Sites

Speaker: Margaret Suozzo, ACEEE

- Margaret presented a series of slides reviewing current installations and results throughout the country, with a focus on New York State installations. The group was queried about interest in participating in a case study or a demonstration project initiating single color or three-color retrofits. The following groups were interested in contributing as a case study (key features of the potential case are listed in parentheses):
 - Onondaga County (installation of meters)
 - White Plains (maintenance cost savings and liability reduction)
 - Westchester County (creative financing)
 - City of Kingston (co-funded through a grant from DOT)
 - NY City Department of Transportation (large installation, outsourced maintenance)
 - NY State Department of Transportation with support from its supplier (substantial installation, move toward red and green retrofits, offers contacts with direct experience throughout the state).

- Margaret or Jennifer Thorne of ACEEE will contact interested parties about case study and demonstration site participation.
- Melissa Lucas of the Consortium for Energy Efficiency (CEE) said that case studies developed by CEE will be available in early 2001 on the CEE web site: www.cceformt.org

6. Feedback on Outreach Efforts and Tools

Speaker: Paul Vrabel, ICF Consulting

- Paul led a discussion about the draft LED brochure and asked participants for input. Participants offered:
 - Savings figures are too low. It was noted that the dollar cost savings are not annual but represent a 60-day period. The brochure will be revised to show savings based upon an annual period.
 - Other ideas were to show percent savings instead of dollar savings.
 - Add non-monetary benefits, including human-factor benefits, i.e., people respond favorably to LED traffic signals' visibility and aesthetics.
 - Add financing opportunities available through NYSERDA.
 - Add mention of pedestrian signals.
 - Add safety benefits for maintenance workers due to reduced nighttime lamp replacement calls.
 - In general, include LED benefits listed under item number two.
- Paul led a discussion about the life-cycle cost tool and asked participants for input. Participants offered:
 - A simpler tool is better than a more complex tool, at least initially. Per signal face inputs would require too much detail for a "back of the envelope" style calculation. However, a more complex tool would be needed for some municipalities.
 - Per intersection basis is the way it should be set up.
 - Having a section for emergency/scheduled maintenance is important.
 - There should be at least mention of liability benefits; potentially this number could be provided as a range. White Plains and Philadelphia are sources for that information. Participants noted that payback is the most useful financial indicator, but when queried as to whether additional financial indicators should be included (internal rate of return, return on investment, net present value, etc.), participants were indifferent. Team members thought adding these indicators couldn't hurt.
 - The tool is missing avoided re-lamping costs, and installation costs.
 - The tool should have a "roll up" feature that allows the user to input several types of traffic signals and easily calculates savings to convert them from incandescent technology to LEDs.
- ICF will change the savings figures in the brochure to represent annual savings.
- ICF will incorporate into the brochure participant suggestions for additional information.
- ICF will make changes to the life cycle cost tool to reflect participant suggestions.
- Margaret will work with White Plains to document liability savings. She will research the already documented Philadelphia liability savings.

7. NYS Specification and Procurement

Speakers: John Bullough, LRC and Guillermo Ramos, New York State Department of Transportation (NYS DOT)

- John Bullough spoke about the work that the LRC has done with the LED specification. Of particular note was the issue of the ITE interim specification for yellow luminous intensity (LI) (4.6 times that of red LEDs).
- John led a discussion about luminous intensities of LEDs and a proposed NYS specification. John presented a handout of the proposed specification. Participants offered:
 - Despite the fact that the LED traffic signal intensity requirement is lower than incandescents, LEDs are generally brighter than incandescents.
 - Connecticut has adopted a LI specification for yellow LEDs that is about 2 times the red LI specification (as opposed to 4.6 times the red LI specification in the ITE specification).
 - Yellow beacons that have an LI of 2 times that of red, which operate 50% of the time, are a cost-effective retrofit.
 - Long-life incandescent lamps last typically 5-6 years.
 - Pedestrian signal outages are responsible for a high number of liability suits.
 - Some localities have elected to flash signals at night, others have decided not too. These decisions have been made based on a combination of the energy savings benefits, the potential safety risks, and DOT recommendations.
 - Yellow beacons (school zone) with continuous operation (4,380 hours per year) provide immediate paybacks.

- John mentioned that the ITE specification is an interim specification. John added that ITE would revisit their recommendations for luminous intensity and revise as necessary.
- John spoke about other specifications that have lower LI ratings for yellow, in particular, Minnesota.
- Participants discussed the issue of LI on large angles. Of note:
 - Upward angles are important to address.
 - Hills are a problem when driving down toward a signal.
 - Wind is a problem due to the light weight of the signals and the sharper cutoff of LED signals.
 - Tethering was discussed and the issue of whether or not to include it in a specification was left unresolved.
- John asked if there are benefits to using all three signal colors. Participants responded.
 - For battery backup, three-color is better.
 - Three-color LEDs are good for dangerous intersections because lamp outages are significantly reduced.
 - Low voltage controllers are safer to work on.
 - If a signal is a remote, time spent on travel to repair a burned-out signal is lessened.
 - Maintenance savings are reduced because people do not have to replace the green and yellow lamps as frequently.
- Guillermo spoke briefly about the NY State Department of Transportation procurement policies and presented pricing information. Guillermo directed the group to the Office of General Services web site: <http://www.ogs.state.ny.us/purchase/spg/awards/10254ta.htm>
- John thanked participants for their time and willingness to continue the dialog necessary to make the NYSERDA program a success.
- LRC will incorporate participant suggestions into the model LED traffic signal specification.