

**STREETLIGHTS COMMITTEE INTERIM REPORT**  
for the period March - September 2018

**Summary**

In a nutshell, eleven Streetlight Committee members met and worked on this project during the reporting period, March-September 2018.

During this period, the Committee learned and demonstrated that it is possible to preserve and maintain the existing radial wave street light fixtures (vintage heads). What follows are the details about the Committee's work to date.

The Committee wishes to take this opportunity to recognize the Select Board's support, and the willingness of Eversource representatives to partner with the town in approving and maintaining the vintage heads. And, thank town residents for their feedback, interest, opinions, and support, most notably, shared in Community Conversation, held September 24, 2018.

**Background**

At the March 2018 Annual Town Meeting, 75% of Town residents in attendance voted in favor of Warrant Article 7. This Article was put forth to rescind the 2017 Town Meeting Warrant Article 3, which would have replaced each light fixture.

Leading up to Town Meeting, several town residents acted to educate friends and neighbors about the historical significance of the vintage lights and legacy system, and worked together to bring forward the petitioned article for a Town Meeting vote.

The Article mandated the town to retain the existing radial wave streetlight fixtures, petition Eversource for support in maintaining them, and consider energy and costs. (See page 1 of the Community Conversation Presentation, attached.)

Subsequently, a Committee organized to work on this.

**Participating Committee Members**

Andrea Hodson	Barb Watkins	Chick Colony
Don Scott	Erin Hammerstedt	Kathy Bollerud
Kathy Scott	Katrina Farmer	Pat Colony
Ryan Stone	Seth Farmer	

**Committee contacts and resources**

Laurel Boivin and Mike Lee, Eversource liaisons  
Willis Lamm, Joe Maruth, and Steven Zalinis streetlight specialists  
Barry Williams, President, American Streetscape Society

**The Historical Significance**

There are several distinguishing features and characteristics of Harrisville's streetlights that are worth briefly reiterating, and which have been presented to the community in numerous forums.

1. The town's radial wave streetlights were installed beginning in 1915, predating the Rural Electrification Act of 1936, and the automobile.

2. During that time, this area was a thriving hub of commercial and residential activity. The lights were installed to illuminate heavily trafficked footpaths leading to/from our three operating train depots, and along the main road into Keene, Brown Road.
3. Over the course of the last century, the town saved the Boston Wheeler brand lights. Once everywhere in New England, they are now nearly extinct. Produced in the 1950s, the vintage heads are cast aluminum, ceramic enameled tin shades, and made in the USA.
4. Today, the legacy system persists as a visual reminder of the early 20th century mill town. They illuminate the original, largely unchanged roadways.
5. And, having the actual, original, historic lights, not “replicas”, is a unique situation across the country. As the Committee learned from Barry Williams, President of the American Streetscape Society, no other town has as many intact and as complete a system as does Harrisville.

(See pages 2-5, Community Conversation Presentation.)

The town has considered the PEMCO retro light fixtures, a slightly different radial wave fixture prevalent in Baltimore and Philadelphia. These do not look the same, most noticeably when they are on at night. Nor would they fit the historic integrity in the history of municipal lighting.

### **The Fixtures and Bulbs**

Once the historical value of the lights was realized, it became important to establish whether the vintage heads could be refurbished in the first place. For this, the Committee consulted several streetlight specialists, Joe Marauth, Steven Zalimas, and Willis Lamm.

Tapping into the pile of streetlights stored in the town barn, the Committee started by having two fixtures refurbished. The cost was \$200 for each unit, and once completed, effectively proved it is possible to restore the vintage fixtures.

Next, the Committee needed to prove that the refurbished heads would meet prevailing standards. At a meeting with Laurel Boivin and Mike Lee (Eversource), the Committee showed them the prototypes, which they examined. Lee noted the simple and easy-to-maintain design. Specifically, the wiring and usability of the aluminum heads, and the addition of a bug shield. He would later approve them for installation.

With a simple design built to last, the Committee anticipates that in their refurbished state, these heads will serve another 50-70 years.

Just as important, the fixtures are versatile. At this juncture, they are fitted with 100 watt ,1000 lumens incandescent bulbs made by the Aero-Tech Light Bulb Co. These are rough-service rated (for outdoor use), with a service span of 20,000 hours (roughly five service years).

The fixtures will also accept LED bulbs.

The Committee has observed a quickly-evolving LED market, which now already includes an Edison-style filament bulb which casts the same color and brightness as an incandescent bulb, using only 12 watts. It is also rated with a similar service span of 20,000 hours. At this point, the bulb is not yet rated for rough service, but does indicate that the prospects are good for an an LED-bulb conversion that will closely match the quality of incandescent lighting.

(See pages 8-9, Community Conversation Presentation.)

## Maintenance and Inventory

**Vintage heads.** The Committee was equally concerned about whether Eversource would agree to maintain these fixtures. Having examined the refurbishment work, and discussed the historical significance of the legacy system with the Committee, Boivin and Lee recognized the unique situation of the town.

They approved the refurbished fixture relative to prevailing standards, and agreed to use the refurbished fixtures to replace broken ones.

At one time, 16 lights were removed and donated to Harrisville by PSNH (Public Service of New Hampshire), circa 2006. These lights have been stored in the old town barn. Anticipating that Eversource would soon deploy a crew to check the town's streetlights, 14 more heads were refurbished in order to have on hand a supply of replacement parts for the crew as needed.

When the Eversource crew arrived, August 23-24, 2018, 20 lights were out. On this service call, many needed new bulbs, sensors, and rewiring. Six fixtures needed to be replaced altogether, and the town's refurbished fixtures were used to replace them.

This leaves 10 refurbished lights in stock for future service calls, plus 6 more that have not yet been refurbished.

**Shades.** There were also 13 radial wave shades in storage, 10 were used by the Eversource crew in August, leaving a balance of 3 plus a radial wave shade provided by the Committee to Eversource with the heads for their inspection.

**Bulbs.** While Eversource had some incandescent bulbs on hand, they no longer stock these. Again, in anticipation of the service call, the Committee procured a case of 29 to have on hand for the service call. Twenty were used, leaving nine in stock for future calls.

## Operating Costs

Another important aspect of the streetlight project that the Committee looked at is ongoing operating costs. Using available data, we compared the cost of the existing light system to a scenario using LED lights. (See page 7, Community Conversation Presentation.)

It would make sense that by converting to LED bulbs, which use approximately 76% less electricity than the incandescent lights, the town would save a significant amount on its operating costs each year.

While there would be a savings, the difference is closer to 50% than the 76% that might be expected.

We made the following calculations based on our best understanding of the rate plan. Actual numbers may not be exact, the ratio of incandescent to LED is more solid:

The bill for streetlights is comprised of three parts:

1. Transmission charge,
2. Stranded cost recovery, and
3. Distribution

The first two are related directly to the energy used by the lights, with a transmission charge of 1.634 cents per kWh plus a stranded cost recovery of 0.086 cents per kWh, for a total of 1.72 cents per kWh.

This equates to an estimated \$7.84 per incandescent fixture per year, or \$431 for the existing system, versus \$1.87 per LED fixture per year, or \$103 for the whole system if and when the town converts to LED bulbs.

But the third cost – distribution – is the biggest piece. As the Committee understands this, the distribution cost is calculated differently for incandescent and LED lighting.

Under the Outdoor Lighting rate plan, the monthly distribution rate for the 600-lumen, 105-watt incandescent lights that are in place is \$9.26, or \$111.12 per year per fixture. That is \$6,111.60 for the whole system each year.

Under the LED/Energy Efficient Lighting rate plan, the monthly distribution rate is \$3.43 per fixture, plus 5.21 cents per watt. For a 25-watt LED, this equates to \$56.79 per fixture per year, or \$3,123.45.

When added together, incandescent lights cost \$118.96 per fixture per year (\$6,542.98 for the system), and LED lights would cost \$58.66 each (or \$3,226.56 for the system).

This means the total annual operating savings to the town for converting to LED streetlights would be approximately \$3,316.42, or very nearly 50%.

The estimated total annual additional cost of operating the town's 55 incandescent streetlights is \$3,316.

As a community, we would need to decide if the quality of light and historic character that the incandescent bulbs provide is worth this cost until appropriate LED options become available.

## **Capital Costs**

Referring to page 8 of the Community Conversation Presentation, attached, the Committee revisited the capital costs of all three lighting options. That is, the existing radial wave, Affinity cobra head, and PEMCO reproduction radial wave lights.

At approximately \$12,000, refurbishment of the existing radial wave lights initially costs about the same as the installation of new Affinity (cobra head) lights, not including the value of any available rebates.

However, the future maintenance costs are quite different. While the incandescent bulb can be replaced at a cost of \$3 (installation included under the existing rate plan), the Affinity lamp head would have to be replaced in its entirety, which would cost approximately \$234, including the cost of the new head and the installation charge.

These heads come with a 5-year warrantee, but little is known about their long term performance. As noted elsewhere, the Committee is confident that the refurbished vintage heads will last another 50-70 years with minimal maintenance cost.

The Committee revisited the PEMCO lights, and feels that this option is relatively and unnecessarily expensive (and would not hold true to the historic fabric). Therefore, this option has not been considered in greater detail.

## **Energy Consumption**

The Committee has also dug into energy consumption, comparing incandescent and LED bulbs.

Based on the monthly hours of operation established by Eversource, each 105-watt incandescent streetlight uses 456 kWh of electricity each year. Therefore, we estimate Harrisville's 55 streetlights use 25,080 kWh annually.

Using the same formulas, 25-watt LED streetlights would use 109 kWh of electricity each year. So the town would use 5,995 kWh and save approximately 19,085 (or 76%) for the entire existing streetlight system.

To help put this in perspective, according to the U.S. Energy Information Administration, the average U.S. residential customer uses approximately 10,909 kWh per year, while the average household in New Hampshire uses about 7,548 kWh each year.

Based on these averages, the total energy used by Harrisville's entire existing streetlight system is approximately equivalent to 3.3 New Hampshire households.

The amount of energy used by the incandescent streetlight over that of an equivalent LED streetlight system is the equivalent of that of 2.5 New Hampshire households.

Again, the Committee fully expects LED technology to reach a quality of light similar to the current, incandescent bulbs, and the existing fixtures accept both bulb types.

Until the town acts to switch to LED bulbs, then, energy reduction could only be achieved by reducing the number of lamps we run throughout Harrisville. The question of how much lighting is enough leads us to another area of concern, safety.

## **Safety**

Although streetlight placement is not within the scope of the Committee's work, we note that overall, lighting meets NH Department of Transportation criteria — they improve visibility after dark. Increase pedestrian safety after night fall. Aid navigation through and around town, and make some of our signs more visible. And, help reduce glare from oncoming vehicle headlights.

Feedback from the community suggests that there might be other locations that could be considered in the future.

## **Utility Contract**

As the Committee became more familiar with the OL and EOL plans, we are collecting considerations to be further researched and discussed with the Select Board:

- Eversource has agreed to maintain the vintage light system within the current OL plan as long as the town provides the parts, which they no longer keep in their inventory.
- Eversource has indicated the town can stay with the OL plan. And, in all fairness, the town and Eversource will want to monitor the failure rate of the refurbished lights.
- Under the OL plan, six fixtures were replaced with the refurbished heads at no additional cost for installation. This would not be the case to replace working heads.
- In the OL plan we pay a slightly higher distribution rate towards maintenance, whereas in the EOL plan, we pay for maintenance as noted elsewhere.
- We need to anticipate whether and at what point switching to LED bulbs will trigger new contract requirements, or what type of contract would be required.

## **Project expenditures**

Expenses have been submitted to and approved by the Select Board for payment:

- \$3,200 to refurbish 16 radial wave fixtures; plus,
- \$68 to restock 29 incandescent bulbs.

## Summary

To sum, what the Committee has thus far learned and demonstrated is that it is possible to partner with Eversource to maintain the radial wave street light system. We also learned and demonstrated that it is possible to refurbish the radial wave fixtures, and to do so inexpensively.

As an Eversource official remarked when we shared the prototypes, their simple design is easy to maintain. They are also built to last. And, just as importantly, they can be adapted to LED bulbs when a suitable bulb becomes available. At this juncture all lights are turned on, and in the process of turning them on, six refurbished vintage heads were installed by Eversource.

It is worth noting that while this initiative did not roll out in the way that the Select Board would have preferred, the Board has been supportive and the Committee is gratified to have the Board's appreciation for what we were able to get done thus far.

We look forward to preparing a recommendation for the March 2019 Town Meeting in part driven by the questions participants raised at the Community Conversation meeting:

- What more should be done?
- What is the plan for refurbishing the remaining lights?
- What about budget and timeline?
- Could cost be subsidized by a grant or HHI assistance?
- Should the streetlights be uniform across town, or not?
- How can non-conforming lights be removed?
- When and what will it take to move to LED bulbs?

Respectfully submitted with thanks by the Streetlight Committee, September 28, 2018