

To: Shelburne Selectboard
From: Shelburne Energy Committee

1 August 2023

Final Report – Recommendation for Streetlight Conversion to LEDs

1. Energy Committee Goals

The Energy Committee was formed to identify Shelburne’s largest users of energy and find proven solutions to lower associated expensive and wasteful costs. Our mission is to help Shelburne assume its role in the national effort to reduce our share of carbon emissions as much as possible. We seek answers to this simple question: How can we make sure the associated financial savings remain in our town’s coffers and taxpayers’ pockets? We are demonstrating that responsible short-term investments in our buildings and infrastructure reap substantial long-term savings.

This report discusses the various alternatives for replacing our streetlights with a more energy efficient option. The Energy Committee recommends an approach that:

- a. Will provide the town taxpayers with significantly greater long-term savings, following an initial implementation cost.
- b. Will engage a well-vetted expert in streetlight lighting to provide a cost-optimized solution.
- c. Considers safety, traffic patterns, neighborhood life, and impacts to residents’ property and health, all of which contribute to our charming town.

2. What Are Other Towns Doing About Streetlights?

Many towns in Massachusetts, including Buckland, Athol, Erving, Hadley, Sunderland, (to name a few nearby) have chosen to buy their own streetlights when converting to LED lights. We set out to answer why this is a prevailing option in our state. What compelled towns to decline the free lights offered by their electric companies in favor of spending money to invest in ownership of their streetlights? Why did they choose to assume maintenance responsibilities that electric companies had formerly provided? Why did their Finance Committees support this choice, and their Selectboards designate ARPA funds? Why did their residents approve the purchase at Town Meetings? In short, what did these towns know that we did not? We discovered that the cost of maintenance as well as the options to customize and control their LED lighting were among the main reasons stated for purchasing streetlights back from energy utilities.



Two examples of shielded 30W LED lights installed by Eversource. On the left, the light on Masonic that the neighbors like. But what if there were a house behind that light instead of forest? How would the residents in that house feel? On the right, the house on Water Street that is behind the shielded 30W Eversource light, an example of light trespass due to not having fully shielded fixtures. Eversource offers no second shield on their LED lights.

3. The Eversource Option

Once installed, the Eversource bill for streetlights would be about \$10,000 per year, or roughly a \$5,300 per year saving compared to our present bill of about \$15,000 per year. (See Appendix A.) Eversource offers a single bulb option without customization, the 30-watt, 3600 lumens, 3000 Kelvin LED light. We have observed that this light casts a glaringly bright white illumination across a broad expanse that not only lights up streets and sidewalks, but also lights up yards and dwellings and shines in residents' second-story windows. The two Eversource demonstration LED lights on Water Street and Masonic Ave, to which shields were added, do indeed shield the glare on one side of the light, but more brightly illuminate the other side, as illustrated in the two photos above. So, the issue may be solved for one homeowner while passing the problem to another.

4. Energy Committee Recommended Approach: A More Cost Effective, Energy Efficient Alternative That Offers Customization and Choice

Based on our goals to save the Town energy and money, we recommend that the Town of Shelburne, like more than 100 other municipalities in Massachusetts have done, acquire ownership of our streetlights from Eversource. We can consider using the RFP/Bid process to hire a reputable lighting consulting company to provide us with: a comprehensive evaluation of the lighting needs in our present streetlight locations; selection of the most efficient, state-of-the-art, dimmable LED lights that are appropriate for their locations; as well as installation and

subsequent maintenance and repair. This company would advise on and install a LED streetlight system that provides the greatest savings on the town's utility bill, minimizes our annual electricity demand, and provides the best lighting array that illuminates our streets and byways without casting bright, unwanted light onto and into nearby yards and dwellings. LED streetlight technology has improved dramatically in recent years, and professional expertise is needed to provide us with the best possible solution to our streetlight challenge. We would likely opt for LED lights between 2700 and 2200 Kelvin, providing a warmer color light that is less intense (easier on the eye) than the 3000 Kelvin lights that Eversource has offered.

One important consideration is the use of dimmable lights, which are not offered by Eversource. These could further reduce energy use between midnight and 5 AM, and the savings reflected on the town's energy bill. Pros and cons of a "Smart" system with more opportunities for controlling each light can also be considered. It should be noted that a lower wattage has been found to be acceptable, even preferred in other towns, over the 30-watt fixture that Eversource offers. For example, some Buckland residential neighborhoods have 17-watt bulbs and Sunderland uses 20 watts. Greater energy and cost savings are possible!

5. Cost Savings of the Recommended Approach: Annual Maintenance Fees Are Key

Following an initial investment, our recommended option yields roughly \$11,000 per year savings on our present Eversource streetlight bill, which is \$5,700 per year savings of taxpayers' money over and above what Eversource has offered our town as a "free" LED replacement. (See Appendix A.) Upfront costs could be paid off in 3-10 years (depending on the mechanism for funding the project) and long-term savings would then be realized. Our recommended action vs. the Eversource option will result in less kilowatt hours expended each year on streetlights. But the savings are not due so much to a difference in kilowatt hours expended, as to the difference in annual maintenance fees. Eversource charges a "rental" (maintenance) fee of about \$8,300 whereas the alternative companies charge about \$2,400 for maintenance and repair. (See Appendix A.)

6. Examples of Energy Consulting Companies Used Extensively in Massachusetts

- a. RealTerm Energy: We have communicated extensively with RealTerm Energy (RTE), founded in 2013, a North American leader in LED & Smart Lighting, having partnered with over 350 small to mid-sized municipalities across the U.S. and Canada, including 20 in Massachusetts. They provided us with a "desk-top-study" that estimated the cost of providing Shelburne with a turn-key municipal LED streetlight system. RTE is a qualified Energy Service Company (ESCO) by the U.S. Department of Energy and can be sole sourced for their services according to MA procurement law. RTE can subcontract maintenance and repair to a qualified company in the area.
- b. Tanko Lighting: In response to our Town Administrator's appropriate recommendation that we consider more than one municipal lighting consulting company, we have identified and communicated with Tanko Lighting, another ESCO company of comparable size to RealTerm Energy that has provided their services to 49 Massachusetts towns, including Dracut, Webster, Erving, and Palmer. They are recommending actions

comparable to RTE's. First, a comprehensive Investment Grade Audit (IGA) of our present streetlight configuration, which entails on the order of 30 measurements at each light location in our Town – light wattage, a quantified illumination pattern, fixture height above the roadway, width of the roadway and adjacent sidewalk, tilt of pole, length of cobra head support arm, wiring configuration, and more. This is followed by recommended light fixtures for each location after consultation with our residents, fixture acquisition and installation, and optional management of subsequent maintenance and repair. Like RealTerm Energy, Tanko Lighting would subcontract maintenance and repair to a qualified company in the area.

7. Cost Estimate

One company estimates the cost to do all the tasks described in 6.b, above, at about \$55,000 (Only members of the Selectboard and the Finance Committee can access this proprietary and confidential document through the Town Administrator. We have highlighted in yellow key information for their convenience.) This figure of \$55,000 includes the cost of acquiring ownership of our streetlights from Eversource, an investment grade audit, and the purchase and installation of the new LEDs. The exact cost and savings cannot be pinned down until the investment grade audit has been completed.

We are not recommending that we necessarily go with either RealTerm Energy or Tanko Lighting. We could use the RFP/Bid process to hire the lighting consulting company best suited to service our needs at an acceptable price. For example, Saco, Maine conducted such an RFP in April 2021 for their ~1500 streetlight replacement and received bids from seven companies. (They ended up selecting RealTerm Energy.)

8. Funding Ideas

We are scheduled to meet with the Finance Committee on August 7 to discuss how best to accomplish our recommendation. Below, we lay out options to consider. The Finance Committee may generate more.

- a. Stabilization Funds-- One option to consider is to use town stabilization funds, which are used to fund necessary capital items. Recognizing that if the project indeed costs \$55,000, our projected ~\$11,000 per year savings on our light bill would pay back the fund in 5 years. From then on, these savings would accumulate annually for other town needs, although a small amount should be set aside for future light replacement. The expected lifespan of good LED streetlights is now 100,000 hours, or 25 years. (There are about 4,000 hours of darkness in a year.) If the expenditure of stabilization funds requires approval of a warrant at a Town Meeting, then we would advocate having a special town meeting as soon as possible to get the ball rolling. Alternatively, this warrant could be considered at our next Annual Town Meeting. The loss of energy savings in the meantime would be offset by greater savings later.

- b. Grants To Cover the Cost: Shelburne is a Green Community and is eligible to apply for two Green Communities grants. The first is a Municipal Energy Technical Assistant Grant (META) that provides the funds needed to undertake the investment grade audit. This application does not require our previous grant for Cowell Gym HVAC installation to be completed. The application deadline will be this November (2023) with funding awarded in late winter. This will then enable us to apply in the spring for a Green Communities Grant for the remaining costs of acquiring ownership of our lights from Eversource, and for new LED light purchase and installation. This grant application can include 10% of the total cost to pay a technical assistant to oversee the project administration for the town. Shelburne has received such aid for other projects. We were told by the Green Communities coordinator for western Massachusetts that streetlight conversion grants have been awarded to other towns in the past and he “see(s) no reason why Shelburne would not be funded.” The Green Communities Grant would be submitted in Spring 2024, with funding received in Fall 2024. Lights would ultimately be installed in mid-late 2025, at no cost to our taxpayers.

- c. Tax-Exempt Lease Purchase Agreement: Another option is to undertake a tax-exempt lease purchase agreement with 5, 7 or 10-year duration. (See, for example, p. 15 of the confidential proposal available at the Town Administrator’s office.) The town’s cost for the loan payments and streetlight operations would not rise above what is presently paid to Eversource for our lights (~\$15,000 per year). Considering the 7-year lease option instead of the Eversource LED offer, we would save about \$9,000 versus the ~\$37,100 Eversource savings over the 7-year interval of the lease. After that, however, our recommended system would save ~\$11,000 per year, thereby catching up with the Eversource accumulated savings in Year 12, assuming present-day prices.

9. Why Not Take Eversource’s Offer Initially and Then Pursue a Preferable System Later?

The idea has been put forth to accept Eversource’s “free” offer and then pursue the hiring of an Energy Service Company in a couple of years. The selling point is that any LED’s would at least be saving energy over the existing sodium vapor lights and ~ \$5,000/year while we raised funds to hire a streetlight consulting company. However, the cost of acquiring ownership of the streetlights from Eversource would most likely rise substantially from the current \$14,000 to cover their investment in the LEDs that they installed and the associated labor costs. In addition, pursuing this option would undermine our ability to seek grant funds. A granting agency is not likely to fund the replacement of one relatively new LED system for another LED system, even if it is more energy efficient. Thus, we may be “stuck” with the undesirable Eversource lights and miss out on the additional \$6,000 savings per year discussed earlier.

10. Future Maintenance of the Lights

Both RealTerm Energy and Tanko Lighting offer maintenance contracts that would cost the town about \$2 per light per month, or \$2,376 per year for our 99 streetlights – far less than Eversource’s \$8,280 per year charge. RTE provided us with a sample maintenance contract, now available through the Town Administrator, with key statements highlighted by us in yellow. We would have the option to accept this contract for any number of years or choose to engage with a maintenance company ourselves. Are we likely to have maintenance options that are cheaper than Eversource’s in future years? We see no reason for this not to be the case. With so many municipalities in Massachusetts now owning their streetlights, including many within our area, qualified companies will undoubtedly be vying for maintenance contracts that are less costly than Eversource’s. LED streetlights now have an expected lifespan of 100,000 hours, or 25 years when operating for about 4,000 hours per year. Sodium vapor streetlights have a typical lifespan of about 24,000 hours, or 6 years.

11. Conclusion

More than 100 municipalities in Massachusetts have undertaken LED streetlight replacement following the path that we are recommending. The long-term savings involved, both in energy and money, cannot be disputed. The Energy Service Companies (ESCO) with whom we have communicated thus far are highly regarded by the communities that have benefited from their services.

The mission of the Energy Committee is to lower the town’s greenhouse gas emissions as much as possible, as rapidly as possible. Our generation owes this to our children and grandchildren. We focus on reducing energy costs and maximizing savings. The question is: Who’s pocket do we want these savings to go into? Eversource’s or Taxpayers’?

Appendix A - Comparison of proposed options

	Budgeted	Proposed	Proposed	Proposed
	HP Sodium Eversource	30W LED* Eversource	25W LED** consultant	Dimmable LEDs** consultant
Number of Fixtures	99	99	99	99
Annual Electricity Consumption (kWh)	40,716	10,271	11,944	8,611
Supply and Delivery Cost	\$5,759	\$1,453	\$2,155	\$1,554
Annual Rental / Maintenance Cost	\$9,321	\$8,280	\$2,376	\$2,376
Total Streetlight Expenditures	\$15,080	\$9,733	\$4,531	\$3,930
Savings/year over present	N/A	\$5,347	\$10,549	\$11,150

* Eversource proposes 30 W LEDs at every location in town, regardless of present wattage installed

** Consultant proposes 25 W at 85 sites but somewhat higher W at sites that presently have higher watt sodium vapor lights.

Cumulative savings

For comparison we rounded off the above savings that accumulate year-by-year with the Eversource option or the Energy Committee (EC) recommendation over the lifespan of LED lights.

	Year 1	Year 2	Year 3	Year 4	Year 25
Eversource LEDs	\$5,300	\$10,600	\$15,900	\$21,200	\$132,500
EC Dimmable LEDs	0	0	\$11,000	\$22,000	\$253,000