Street Lights:

One town's plan

STREET LIGHT GUIDELINES

Harry L Young

Jaffrey, NH

One town's efforts to save energy through street light conversion:

1. Contact town/city government officials to inform them of your desire to establish a street light committee.
2. Present the proposal at town/city government meeting.
3. Request that the members include the police and fire chiefs.
4. Solicit supportive members. For a town of 5,000, 6 members is recommended, plus police chief and fire chief.
5. Request a presentation from your utility company regarding a street light conversion. They can supply charts, graphs including costs of various lighting options as well as a survey form.

6. Select survey teams consisting of 2 people per car per 100 lights.
7. Verify accuracy of the utility survey form by checking pole numbers during daylight. Complete survey form to identify location of light, and recommendations to remove or reduce wattage.
8. Verify recommendations with night observations.
9. Collect and record all information on one form, preferably an excel spread sheet with streets in alphabetical order.
10. Give town/city officials regular updates on progress.
11. Provide the press with committee's progress and goals.
12. If possible, use computerized maps to designate lights to be removed and ones to be reduced in wattage.
13. Review map for lighting area consistency.
14. Provide police chief and fire chief with list of lights to be removed and have them approve the removals for safety issues.
15. Present proposal to town/city officials.

JAFFREY STREETLIGHT COMMITTEE PLAN

Development of Streetlight Plan

Waste and inefficiencies in the Town's street lighting system have been a focus of the Jaffrey Energy Committee. The Town's ad hoc Street Lighting Committee[i] was established by the Selectmen in late 2007 at the request of the then Chair of the Energy Committee, Harry Young. The Selectmen directed the Committee to "study the town's lighting to save money and reduce global warming." The Committee has worked hard, conducting a comprehensive survey of the Town's streetlights, researching the literature regarding streetlight purposes and uses, adopting a statement of guiding principles and criteria, and developing a draft plan for fundamental change in the Town's streetlight system.

Public Review of Plan

The Streetlight Committee presented the draft plan for public review to the Jaffrey Board of Selectmen on March 3, 2009, to Town voters on March 10, 2009, to Town Meeting participants on March 14, 2009, and to public listening sessions on March 31, 2009 and April 2, 2009. Comments received during the course of this public review have been predominantly positive. The Committee's response to the few concerns that were expressed during this process is as follows:

> *Pilot Project: The Committee considered but has rejected a suggestion for a pilot or experimental program in which a few lights in an area might be temporarily removed as a way of trying to assess the plan's impact prior to full implementation. The Committee believes that a pilot in one part of the town is unlikely to provide meaningful information regarding the Plan's impact in other parts of town due to the diverse and unique configuration of streets and neighborhoods throughout the town. Furthermore, to be an accurate test in any one area, the Committee believes that not only would some lights need to be turned off, but that the new, brighter, downward-directed lights proposed for the pilot area would also need to be installed. Installation costs for such a pilot would be significant and cannot be justified given the likely inability to generalize from one pilot in one part of the town to the town as a whole.*
>
> *Jaffrey Center: In response to suggestions for the removal of streetlights in the Jaffrey Center Historic District, Committee members have re-surveyed the area and the Committee now believes that 2 or 3 of the 13 Jaffrey Center incandescent lights should be considered for removal. The Committee recommends that the Selectmen refer this suggestion to the Jaffrey Center Historic District Commission for its consideration and action.*
>
> *Other: Concerns in one neighborhood derived from a misunderstanding of which lights in that neighborhood would be turned off and were quickly resolved through discussion with the concerned residents. The Committee carefully considered a concern about the removal of a light that illuminates an area on a dead-end road that is near but not at an intersection and that is at a point where three private driveways enter the road. Although school children may occasionally congregate for pick-up at this location, the Committee does not think the location meets the Committee's criteria for publicly provided streetlights and continues to recommend the removal of this light.*

Guiding Principles Adopted By the Committee:

Provide Needed Lighting: Impelled by critical public safety and community concerns, the Committee is seeking to ensure that the Town of Jaffrey has an aesthetically appropriate street lighting system sufficient to meet the needs of its residents.

Conserve Energy: Impelled by critical global warming and energy security concerns, the Committee is seeking to reduce, to the maximum extent feasible consistent with the Town's street lighting needs, the energy consumed by particular streetlights and by the Town's entire street lighting system.

Save Money: Impelled by critical Town budget and tax burden concerns, the Committee is seeking to reduce, to the maximum extent possible, the recurring and long-term costs of the Town's street lighting system.

Guiding Criteria Adopted by the Committee

Intersections: In general, there should be streetlights sufficient to signal the location of each intersection of major public roads where there is significant vehicular traffic.

Sidewalks: In general, there should be streetlights sufficient to illuminate sidewalks in densely populated areas where there is significant pedestrian movement.

No Wasted Light: The light provided by each street light should be no more than what is necessary to accomplish its purpose, should not illuminate the night sky, and should not shine into neighboring windows or yards.

Energy Efficient Lighting: The Town's new street lights should be state-of-the-art in terms of the light (lumens) provided per watt of energy consumed and in terms of their long-term durability and maintenance needs.

Consistent Lighting: In general, there should be one consistent type of street light, providing light of the same color (whether yellow-looking as in high pressure sodium lights or white-looking as in metal halide lights), used throughout Town."

Plan Recommended by the Committee for Selectmen and Public Review

- The PSNH inventory for the Town currently shows 217 lamps. The Committee found 5 additional lamps that are not in the PSNH inventory. The Committee's baseline is, therefore, 222 lamps.[ii]

- The Committee recommends removing 86 lamps. Lamp-by-lamp recommendations are shown on the accompanying maps and spread sheets. (The Committee's initial list of 96 possible removals has been reduced to 86 recommended removals after review with Police Chief Oswalt.)

- The Committee recommends replacing the 123 remaining lamps that are outside of the Historic District with Full Cut-Off Metal Halide lamps rated at 70 Watts and 5000 lumens[iii].

- The Committee recommends keeping the Jaffrey Historic District lighting pending further review with the Jaffrey Historic District Commission. *The Committee recommends that the Jaffrey Historic District Commission consider removal of two or three of the 13* incandescent lamps *in the District.* PSNH will establish a separate account *for the remaining lights* in the name of the Jaffrey Historic District Commission.

- Estimated results[iv] are $29,329 in Annual Dollar Savings (after payback period) and 17,695 in Wattage[v] (Energy) Savings.[vi] Over 25 years, the estimated dollar savings will amount to $733,225. This amounts to a 64% reduction in annual Town costs and a 64% reduction in energy consumed. The PSNH payback period, assuming an estimated $70,000 conversion cost, is about 2.4 years (or about 3.2 years if Town chooses to realize about $7,362 per year in net savings right away). Respectfully Submitted on March 3, 2009, for the Jaffrey Streetlight Committee by its Chair, Harry Young.

[1] The Streetlight Committee members are: Harry Young, Chair; H. Chandler Gilbert; Douglas Clayton; Anne Webb; Robert Stephenson; Richard Ames; Police Chief William Oswalt, ex officio; Fire Chief David Chamberlain, ex officio.

[1] These 222 lamps exclude DOT and Town owned lamps. The PSNH Baseline of 217 Lamps includes:

- 206 PSNH-inventoried lamps outside of Historic District, of which:
  - 141 are Mercury Vapor @ 100 watts and 3,500 lumens each.
  - 36 are Mercury Vapor @ 250 watts and 11,000 lumens each.
  - 12 are Mercury Vapor @ 175 watts and 7,000 lumens each.
  - 4 are Mercury Vapor @ 400 watts and 20,000 lumens each.
  - 4 are Metal Halide @ 100 watts and 8,000 lumens each.
  - 3 are High Pressure Sodium @ 50 watts and 4,000 lumens each.
  - 2 are Metal Halide @ 70 watts and 5,000 lumens each.
  - 1 is High Pressure Sodium @ 70 watts and 5,800 lumens.
  - 1 is High Pressure Sodium @ 100 watts and 9,500 lumens.
  - 1 is High Pressure Sodium @ 150 watts and 16,000 lumens.
- 11 PSNH-inventoried lamps in Historic District, of which:
  - 8 are Incandescent @ 105 watts and 600 lumens each.
  - 3 are Incandescent @ 105 watts and 1,000 lumens each
- Total Wattage required to power all PSNH Lamps is 28,825, of which:
  - 27,670 watts are required for Lamps outside of Historic District.
  - 1,155 watts are required for Lamps in Historic District.
- Total Annual Cost for all Lamps at current PSNH rates is $45,809.

[1] The Committee had hoped to be able to recommend use of 50 watt, 4000 lumen metal halide lamps, but was informed by PSNH in early February 2009 that PSNH had decided that these lamps were problematic in their design and would not be supported by PSNH. The lumen maintenance curve for metal halide is superior to mercury vapor. In its 2nd, 3rd & 4th years of operation, the 5000 lumen metal halide lamp will likely be providing about 4000 lumens after the 1st year, 3500 lumens after the 2nd year, and about 3250 lumens in the 3rd & 4th years. This is to be compared with Jaffrey's typical 3500 lumen mercury vapor light which is likely to provide about 2800 lumens after the 1st year, 2400 lumens after the 2nd year, 2100 lumens after the 3rd year, and 1800 lumens after the 4th year.

[1] Adjustments to these estimates will be made after final reconciliation of the PSNH inventory with the Committee's list of lights.

[1] Adjustments to this wattage estimate need to be made to account for differences in the power (wattage) consumption requirements of the ballasts that will be used with the metal halide lamps. The adjustments will likely be relatively minor.

[1] *If three of the Jaffrey Historic District lights are removed, there will be an additional savings of between $843 and $3,159 per year (depending on the particular lights removed) and between 2520 and 3780 watts per year.*

JAFFREY STREETLIGHT COMMITTEE

GUIDING PRINCIPLES AND CRITERIA

JULY 30, 2008

Guiding Principles

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RA 2/21/08

Jaffrey Street Lighting Committee – Work Plan

1. Goal: to identify and meet street lighting needs in Jaffrey so that only that lighting (measured in brightness and color) that is necessary is provided, and the lighting that is provided consumes the least fossil fuel derived energy of the available alternatives at the lowest possible cost.
2. Develop inventory of existing luminaires:
    a. PSNH provided inventory as starting point.
    b. Add observer information, including for each luminaire:
        i. If it is currently functioning;
        ii. If it overlaps with or duplicates other lighting sources;
        iii. If it is located at a road junction;
        iv. Whether there is a sky lighting effect or trespassing effect;
        v. Its spacing and area lit relative to other adjacent street lights;
        vi. Assessments of the color of the light;
        vii. Whether more or less or no street light (lumens) at this location is recommended;
        viii. Special considerations (e.g., notes regarding special Historic District lighting)
3. Develop criteria for judging street lighting needs:
    a. Identify necessary functions served by street lights (consider security, traffic safety, special neighborhood or downtown characteristics, rural vs. urban locations, availability of other lighting at particular locations, etc.).
    b. Identify standards for necessary lumens per location of needed luminaires (consider a uniform town-wide standard vs. more than one level of lumens depending on characteristics of location; consider all night lighting vs. partial night lighting).
4. Identify best possible solution using existing and available PSNH rates and equipment (metal halide and/or high pressure sodium; life-expectancy of luminaires; maintenance needs; smart-start; all night lighting only; possible carve-out for Jaffrey Center Historic District (& best options for District if carved out).
    a. Identify dollars and KWHs that will be saved town-wide per year, projected for next 25 years or so.
5. Identify best solution if new PSNH rates are negotiated and approved by PUC
    a. research costs, availability, durability, experience and compatibility with Jaffrey's lighting needs:
        i. Consider lower wattage metal halide & high pressure sodium lamps
        ii. Consider LEDs;
        iii. Consider CFLs;
        iv. Consider partial-night lighting;
    b. Identify dollars and KWHs that will be saved town-wide per year, projected for next 25 years or so.
    c. Identify actions needed to gain PSNH contract with new rates, etc.
6. Finalize and present recommendations to Town Manager and Selectmen.

Jaffrey Street Light Committee
Proposal for
The Board of Selectman

Our mission is to reduce our carbon foot print and the cost associated with providing street lights.

222 street lights in Jaffrey

123 lights: Replace with 70 watt metal halide, full cutoff, 5000 lumens

86 lights: Remove

13 incandescent lights in Jaffrey Center: Continue to review. (Billed separately to the Jaffrey Historic District Commission and paid by Jaffrey.)

$70,000: Estimated cost of conversion (cost to be included in the smart start program)

$29,329: Estimated annual savings

$733,225: Estimated savings for 25 year expected project life

64%: Savings over existing system

64%: Savings in wattage

2.4: Years payback period paid at the current rate

3.2: Years payback period with a $7,362 savings now

(25% of savings to Jaffrey with a longer payback period)

Thank you for your interest in street lights. Please contact me with any questions.
Make a difference, and have fun doing it.

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