Technical Bulletins: Street Lighting, Energy Conservation, and Crime

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Of interest to municipalities debating the merits of saving energy by turning off numbers of street lights is the Emergency Energy Committee of the federal Law Enforcement Assistance Administration's Energy Report No. 2 (same as above title). The following paragraphs are generally direct quotes from this March 1, 1974, publication:

"... Street lights utilize about 0.7 per cent of the electrical energy generated in this nation. (By comparison, indoor lighting consumes approximately 25 per cent of the electrical energy generated). The public's return for this consumption of now scarce energy is a general feeling that street lights have a deterrent effect on street crimes. This effect is somewhat substantiated by research conducted by LEAA and by the fact that various communities which have installed improved street lighting in certain areas have reported reductions in the rate of street crime. Thus, it is the judgment of LEAA that any American community is justified in not taking any action toward reducing street lighting if it so chooses. However, there are two reasons why reductions in street lighting energy consumption by a community may be warranted. Severe energy shortages in some communities may require all possible conservation actions to be taken. In addition, reductions in street lighting energy consumption is a highly visible action which could serve to encourage public participation in all other conservation activities. The following suggestions are presented to assist community planners considering such actions which should minimize the impact of street lighting energy conservation programs on public safety from crime."

1. "Information regarding the energy usage of the community's street lights should be obtained or derived, and the savings derived from any contemplated conservation action should be calculated." A quick estimate, for planning purposes, of usage in a community can be based on the following factors:

   Average wattage per street light = 325
   Average number of street lights per capita = 1 light/20 persons
   Average energy usage per day per light = 3.8 kilowatt hours = 1/3 gallon of petroleum usage

   Based on these figures, the de-activation of all the street lights in a given community would save approximately 6 gallons of petroleum or petroleum equivalent per person per year.

2. "No reduction in street lighting energy usage as a conservation measure should be taken unless it is a part of a comprehensive community conservation program ... the principal rationale for such reductions, given the relatively small energy consumption of street lights, is that such actions could encourage community participation in all other conservation actions." A community program, "at a minimum, should include reductions in indoor lighting levels in particular, as well as in transportation usage,
air conditioning and heating for all public agencies."

3. "Any reduction in street lighting levels in a given area should be made only after consultation with police officials and representatives of citizens in the area concerned, review of night-time crime statistics, if available, and inspection of the candidate areas. It is recognized that street lights perform the dual function of deterring crime and increasing traffic safety, but this report deals only with considerations concerning crime deterrence. Preliminary results of a Kansas City, MO, study indicate that the night-time rate of street robbery significantly dropped in certain areas when improved street lighting was installed."

On the other hand, a study of the patterns of robbery in Oakland, CA, indicated that 67 per cent of the block areas within the city had not experienced a single street robbery in a three-year period. Experience of other cities indicates that the crimes of vandalism, auto theft, and commercial burglary are apparently affected to some degree by street lighting levels. The report lists certain categories of streets to be maintained at present (or improved) lighting levels, and others that might well justify street lighting reduction.

4. "There are some indications that uniformity of illumination may be as important as the intensity of illumination for the purpose of deterring street crime." Thus, LEAA does not recommend turning off every second, third, or fourth light.

Yet, "since no technical data exist on the minimal light levels necessary for adequate deterrence of crime, it is not possible to suggest an appropriate level of wattage reduction. For information, the City of Los Angeles is replacing incandescent bulbs yielding 6,000 lumens of light output with bulbs yielding 4,000 lumens in selected areas as a part of the city's conservation program.

"No reductions in street lighting levels where public safety might be affected should be undertaken until the community has fully explored the alternative of conversion to more efficient types of lights. Mercury vapor lights, for example, utilize about half the energy of the incandescent lights used in many areas for the same resultant light levels, and sodium vapor lights utilize only one-fourth the energy for the same conditions."

For a quick estimate of the cost of replacing incandescent lights with more efficient lamps, the report includes this brief table:

<table>
<thead>
<tr>
<th>Conversion to:</th>
<th>Approximate Cost per Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>175-watt mercury vapor</td>
<td>$150</td>
</tr>
<tr>
<td>400-watt mercury vapor</td>
<td>$210</td>
</tr>
<tr>
<td>150-watt sodium vapor</td>
<td>$250</td>
</tr>
<tr>
<td>400-watt sodium vapor</td>
<td>$310</td>
</tr>
</tbody>
</table>

"These costs do not take into account the often significant discounts given by manufacturers on fixtures."

Of concern to some communities is the environmental effect on trees and plants of sodium vapor lighting. "The potential effects of such increased light levels include the delaying of dormancy of trees in the fall, resulting in increased vulnerability to the advent of cold weather; changes in the blooming and growing characteristics of certain plants . . . and increased sensitivity of some types of woody trees to air pollution, particularly sulfur dioxide." The report offers suggestions for minimizing the potential environmental impact of such lights.

5. "Future street lighting projects should be carefully evaluated to insure that the most efficient street lights, consistent with the needs and financial resources of the community, are installed."
In Energy Report No. 3, "Preliminary Report on Rolling Blackouts," LEAA discusses a technique of temporarily disconnecting various portions of the electric distribution system. This procedure is suggested only when voluntary reductions by users, or reductions made under threat of administrative or civil restraints, have failed to produce the required curtailment.

"When rolling blackouts are imposed, there will be approximately 24 hours' prior notification to the public. Depending upon the local electric distribution network, emergency and essential services may or may not be affected."

"... It is recommended that state and local law enforcement and criminal justice agencies review their emergency electric power requirements against capabilities and prepare appropriate strategies for dealing with rolling blackouts. In this planning, it should be assumed that one or more sections of the city is without electric power for a period of 2 to 4 hours every day."

Energy Report No. 4, "Police Cars and Energy Conservation," provides information on the factors affecting fuel consumption by automobiles and the measures which may be taken to reduce the fuel consumption of police cars. The report discusses car size and fuel economy, operational techniques, fuel saving devices and adjustments, the influence of emission controls, and suggests a fuel conservation program.

Finally, Energy Report No. 7, "Preliminary Report on Crime and the Energy Crisis," emphasizes that a severe shortage of fuels tends to increase certain types of crimes, such as individual assaults and mass disorders, larceny, theft and robbery, and a variety of so-called "economic crimes." Among the latter are fraud, bribery, product dilution, falsification of records, price violations, tie-in sales, black markets, and business license violations. The report ends with suggestions for alleviating the conditions that cause these crimes, and posts a special warning on the siphoning of gasoline, with its serious health hazard.

Tennessee municipal officials interested in obtaining any of these brief reports should contact:

ENERGY
U. S. Department of Justice,
Law Enforcement Assistance Administration,
National Criminal Justice Reference Service,
Washington, D. C. 20530

Each report is dated March 1, 1974. No price is indicated. The complete list of titles of this seven-pamphlet set is:

No. 1 SUMMARY OF RESULTS OF SPOT SURVEY OF SELECTED LAW ENFORCEMENT AGENCIES
No. 2 STREET LIGHTING, ENERGY CONSERVATION AND CRIME
No. 3 PRELIMINARY REPORT ON ROLLING BLACKOUTS
No. 4 POLICE CARS AND ENERGY CONSERVATION
No. 5 SUGGESTED ENERGY CONSERVATION MEASURES FOR COURTS AND CORRECTIONAL INSTITUTIONS
No. 6 PETROLEUM ALLOCATION AND PRICING REGULATIONS FOR LAW ENFORCEMENT AGENCIES
No. 7 PRELIMINARY REPORT ON CRIME AND THE ENERGY CRISIS

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