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REPORT TO COUNCIL

SUBJECT
Approval of a Pilot Project for the Installation of Light Emitting Diode Streetlights and Budget Modification No. 34

BACKGROUND
In an effort to continue with the reduction of the City's carbon footprint and reduce streetlight energy consumption and maintenance cost the Department of Public Works has considered the conversion of all remaining high pressure sodium (HPS) streetlights to energy efficient Light Emitting Diode (LED) fixtures. The City owns and maintains approximately 8,784 streetlights, the majority being the High Pressure Sodium (HPS) type. Out of these, approximately 1,859 HPS lights were converted to LED in 2012, leaving still approximately 6,900 fixtures that could be retrofitted. Sunnyvale also has a large number of street lights attached to PG&E wooden power poles that are operated and maintained by PG&E at the City's expense. PG&E maintained street lights are not part of this evaluation since the City does not own the equipment or control the replacement cycle.

The City's first round of LED retrofits were funded by an energy block grant from the Federal government supplemented by PG&E rebates. The focus of this project was to maximize energy savings by targeting higher wattage fixtures that typically occur on wide streets. A typical retrofit replaced a 200 watt HPS fixture with an 80 watt LED. Energy consumption savings realized after the conversion to LED based on PG&E's calculations and rate schedule effective January 1, 2014 is estimated to be approximately $119,000 annually. Since no City funds were involved a cost-benefit analysis was never performed.

In addition to energy savings, LEDs provide several advantages over the City's current HPS fixtures. Although HPS illuminance values are pretty close to LEDs immediately under the fixture, HPS street lighting typically creates "hot spots" with more light than needed immediately beneath the fixture and "cold spots" further away from the fixture. LEDs provide a more uniform light distribution that improves visibility. LEDs also allow for better control over the amount of light projected on the back of the fixture so it would not be as bright on adjacent residences. Objects can also be distinguished with better clarity under the LED light. This is a safety issue that can assist Public Safety during their nighttime work and allows motorists to more easily identify bicyclists and pedestrians. Finally another important fact about LED streetlights is that their reduced energy consumption delivers significant reductions in greenhouse gas emissions, supporting efforts to combat climate change.

EXISTING POLICY
Land Use and Transportation Element C3.4.3 Implement programs for repair of roadbeds, barriers and lighting.

ENVIRONMENTAL REVIEW

Should the Council elect to approve a project for installation of additional LED streetlight fixtures, the project would be considered exempt from the California Environmental Quality Act under exemption 15301 (3), minor alteration of existing highways and streets with no expansion of use.

DISCUSSION

Since the conversion of approximately 20% City streetlights to LED technology in 2012, the Department of Public Works staff has continued to assess the feasibility of replacing HPS lights with the more energy efficient LED lights. Over the years LED technology has improved significantly and more cities are moving forward with conversion projects to take advantage of the potential savings in electricity usage. Since the City's initial installation project, the price per fixture for LEDs used to replace the 200W HPS lights during 2012 has dropped from $562.04 to approximately $150.00 to $300.00 per fixture. Prices vary based on manufacturer and characteristics of the fixture such as color temperature which affects how white the light appears

Currently it is estimated that 5,632 of the remaining 6,900 HPS street lights are 70 watt fixtures, many in residential neighborhoods. The City's first retrofit project did not replace fixtures of this size and did not focus on residential areas. For retrofits of this wattage staff has evaluated available products on the market and focused on products that are being used by large and small cities such as the City of Los Angeles, and in the Bay Area cities such as Menlo Park, Santa Cruz, San Carlos, Palo Alto, Hayward, and Fremont. Replacements for 70 watt HPS fixtures can vary between 24 and 35 watt LEDs. Performance characteristics such as color temperature of the LEDs also result in variations in the cost per fixture.

Given the City's current lack of experience deploying LEDs in residential neighborhoods staff recommends a pilot project be undertaken to test various fixtures. Fixtures of different wattages and color temperatures would be installed in several different areas and residents would be surveyed regarding their opinions about the new fixtures. Survey data will help establish final specifications for replacement of the most common 70 watt HPS fixtures. Estimated cost for the pilot program is $10,000. Upon completion of the pilot project, staff would return to Council for a final decision regarding a citywide retrofit project.

During the pilot project staff will continue to evaluate options to reduce energy consumption in the acorn style lighting fixtures used primarily in the downtown area. While LEDs are the City's current standard for all new street lights, many of the lights in the downtown area were installed before the new standard was adopted.

Staff has estimated the cost, energy savings, and payback period for a Citywide LED retrofit.

Total project costs are estimated to range between $2.15 and $2.45 million. Based on PG&E's current rebate program the City would be eligible for up to $433,000 in rebates. Estimated savings in energy cost if all existing street lights were to be upgraded to LED would range between $245,000 and $310,000 annually. This savings figure varies depending on wattage of LED fixture selected, and assumes the current PG&E LS-2 rate schedule. Given the range of project costs and savings, an estimated range of simple payback periods is between 4.7 years and 9.6 years.

FISCAL IMPACT

Retrofitting of additional streetlights to LEDs will require the creation of a capital project and

identification of funding. For a complete citywide retrofit, staff estimates the upper end of total capital cost to convert all the existing HPS fixtures citywide at $2,300,000. Overall City outlay would be re-paid over time by annual energy savings, estimated to be $245,000 to $310,000 depending on the LED manufacturer and wattage selected. In this case the lower end savings represent typical retrofit of a 70 watt HPS fixture to 35W LED, and the higher savings end represents retrofitting with 25 watt LEDs.

PG&E rebates may be available to further reduce the capital outlay, although PG&E is currently evaluating whether to continue their existing rebate program. Staff estimates simple payback of 4.7 to 6.6 years with a PG&E rebate, and 6.8 to 9.6 years without a PG&E rebate.

Staff is proposing a pilot project to install a range of LED 70 watt replacement products on street segments in Sunnyvale neighborhoods. This will allow the community to participate in a field test of the LED fixtures and provide decision makers with information on the suitability and community acceptance of LED fixtures in residential neighborhoods. Staff estimates the cost of a neighborhood LED pilot project at approximately $10,000. As the savings from the LED installations would ultimately benefit the General Fund, staff is recommending that the pilot be funded by the General Fund Budget Stabilization Fund. Staff has prepared Budget Modification No. 34 to establish a new capital project and appropriate $10,000 to fund the pilot installation.

Budget Modification No. 34
FY 2013/14

	Current	Increase/ (Decrease)	Revised
General Fund			
Expenditures			
New Project - Residential LED Streetlight Pilot Project	$0	$10,000	$10,000
Reserves			
Budget Stabilization Fund	$46,165,069	$10,000	$46,155,069

PUBLIC CONTACT

Public contact was made by posting the Council agenda on the City's official-notice bulletin board outside City Hall, at the Sunnyvale Senior Center, Community Center and Department of Public Safety; and by making the agenda and report available at the Sunnyvale Public Library, the Office of the City Clerk and on the City's website.

ALTERNATIVES

1. Direct staff to conduct a pilot project for residential neighborhoods to install LED fixtures in several residential areas and approve Budget Modification No. 34 to provide funding in the amount of $10,000 to purchase and install the demonstration fixtures. Direct staff to solicit input from the public to gauge illumination levels and overall acceptance of the new LED lighting levels and light color.

2. Direct staff to make no changes from the existing conditions.

RECOMMENDATION

Alternative 1: Direct staff to conduct a pilot project for residential neighborhoods to install LED fixtures in several residential areas and approve Budget Modification No. 34 to provide funding in the amount of $10,000 to purchase and install the demonstration fixtures. Direct staff to solicit input from the public to gauge illumination levels and overall acceptance of the new LED lighting levels and light color.

Staff believes that the economics of LED streetlight technology continue to be favorable and LED streetlight conversion is an important tool for the City's greenhouse gas reduction efforts. Questions remain about the specifications and compatibility of LED fixtures in residential areas. Therefore a neighborhood pilot project with attendant public outreach is recommended before considering a larger scale retrofit of City streetlights.

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