



# CITY OF HAYWARD AGENDA REPORT

AGENDA DATE 01/27/98

AGENDA ITEM 2

WORK SESSION ITEM \_\_\_\_\_

To: Mayor and City Council  
From: Director of Public Works  
Subject: LIGHT EMITTING DIODES (LED) Traffic Signals

## **Recommendation:**

It is recommended that the City Council authorize the City Manager to execute an addendum to the Performance Based Guaranteed Energy Program's contract with Viron Energy Services to add the LED Traffic Signal Project to the Program's scope of work.

It is also recommended that the City Council authorize the City Manager to execute an addendum for adding funds to the Performance Based Guaranteed Energy Program's established Lease.

## **Background**

Recent advancements in the effectiveness and reliability of Light Emitting Diode (LED) technology as applied to traffic signals have resulted in an opportunity for the City to significantly improve the energy efficiency of its traffic signal system. Presently incandescent bulbs light our traffic signals and are sized for either eight inch or twelve inch diameter lenses. Several years ago various agencies began switching from incandescent bulbs to the same size bundles of Light Emitting Diodes. There were some reported problems with the first generation of LED traffic lights but they definitely used less energy. Now there are newer versions, at least for the red bulbs, which have been sufficiently tested to become certified by Caltrans as meeting the same standards as the incandescent bulbs. With the new LEDs, it is not anticipated that drivers will notice any significant difference in the appearance of the lights. This second generation of LED bulbs uses less than 10 percent of the energy of the present incandescent bulbs. Since the City presently spends about \$240,000 per year on traffic signal energy costs there is the opportunity for significant savings even by just replacing all the incandescent red bulbs and red arrow lights throughout the city.

The City maintains a total of 84 traffic signals; however, based on a cost sharing agreement the City also pays the electric bill for another 36 traffic signals on state highways that are otherwise maintained by Caltrans. In order to maximize the City's potential energy savings, staff has obtained Caltrans' agreement to install the new LED red lights at state maintained traffic signals if the City acquired the necessary materials. Caltrans is following a similar procedure with other cities where they have cost sharing agreements. It is estimated that the City would save \$62,360 a year in energy cost if all of the incandescent red bulbs and red arrow lights in the City were replaced with LEDs. This estimate takes into account the Caltrans' owned lights, the 10 percent reduction in PG&E electric rates and conservatively assumes that the red lights are on 48 percent of the time.

While LED bulbs do save a lot of energy, they do have a much higher material cost. Thus staff also investigated the cost effectiveness of maintaining LEDs as opposed to the current maintenance associated with incandescent light bulbs. The two key factors that affect the maintenance cost of traffic signal lights are material costs and the life cycle of the lights. Staff found that while the material cost of an ordinary incandescent bulb is negligible, a LED lamp can cost as much as \$150 for the 12-inch size. However, an average incandescent bulb will last approximately one year in a traffic signal application, whereas an LED has a life expectancy of about ten years. It should also be noted that the failure rate associated with incandescent light bulbs is approximately ten times that of an LED. Final analysis indicates that although the materials cost for LEDs is much higher than that for incandescent bulbs, the reduction of labor costs associated with relamping of the traffic lights will counteract this increase, and the end result should be no net increase in maintenance costs associated with the implementation of LED traffic lights.

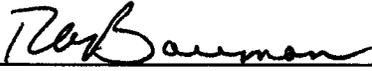
Staff's initial estimate of the cost to purchase LEDs for all of the red bulbs and red arrows in the City and to install those maintained by the City was about \$300,000. In addition staff became aware of a component of PG&E's Retrofit Efficiency Options (REO) Program that would provide a cash rebate toward the materials cost associated with replacing incandescent red ball and red arrow lights with LEDs. In order to be eligible for this year's rebate program, staff submitted an application that was accepted by PG&E. Other Bay Area agencies that are currently participating in PG&E's LED Traffic Signals Program include Alameda County, and the cities of Pleasanton, Dublin, San Leandro, and Antioch. Assuming a total of 786 twelve inch red balls, 649 eight inch red balls, and 259 twelve inch red arrows, Hayward's total rebate would be \$57,385.

Since the total initial expenditure, even with the PG&E rebate, would be over \$240,000, staff is recommending that this LED traffic signal retrofit program be added to and financed by amending the City's existing energy retrofit program, known as the Performance Based Guaranteed Energy Program. Viron Energy Services is presently under contract with the City for implementation of the Performance Based Guaranteed Energy Program. Viron was requested to provide a proposal for implementation and financing of the LED Traffic Signals project. The details for project financing are presented below under Funding.

### **Funding**

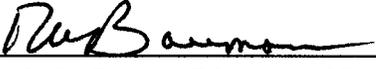
On May 7, 1996, the City Council authorized the City Manager to enter into a contract with Viron Energy Services for a Performance Based Guaranteed Energy Program. On December 3, 1996, the City Council authorized the City Manager to execute a Lease with Option to Purchase Agreement, and other documents necessary to procure lease financing for the Performance Based Guaranteed Energy Program from Access Leasing Corporation. In order to move forward with implementation of the LED Traffic Signals project, while still utilizing the most cost-efficient method of financing, Viron has proposed to handle this project by executing two addenda to its current agreement with the City. Specifically, these addenda will add funding and establish authority for the LED Traffic Signals to be financed and implemented under the existing terms of the agreement associated with the Performance Based Guaranteed Energy Program. Based on Viron's proposal, the required funding for the program is \$286,153, less any PG&E rebate. The lease financing for the net amount includes a five-year term at an interest rate not to exceed 6 percent. Even without the full PG&E rebate, the project will generate a small positive annual net savings over the five-year lease, and an annual \$62,360 in energy savings for each year following the end of the five-year pay back period.

Prepared by:



Robert A. Bauman, Deputy Director of Public Works

Recommended by:

*For* 

Dennis L. Butler, Director of Public Works

Approved by:



Jesús Armas, City Manager

[ss: agenda98\transportation\roxanne holt\led traffic signals 01/23/97]

**DRAFT**

JB 1/14/98

**HAYWARD CITY COUNCIL**

**RESOLUTION NO. \_\_\_\_\_**

**Introduced by Council Member \_\_\_\_\_**

**RESOLUTION APPROVING, AUTHORIZING, AND  
DIRECTING AN AMENDMENT TO THE LEASE WITH  
OPTION TO PURCHASE AGREEMENT NO. 96 - 01, AND  
RELATED DOCUMENTS, AND AUTHORIZING OFFICIAL  
ACTION**

**WHEREAS, the City of Hayward entered into a Lease With Option to Purchase Agreement (No. 96 - 01) (the "Agreement") with Access Leasing Corporation in December, 1996, regarding the acquisition of certain property; and**

**WHEREAS, the City Council desires to amend the Agreement by adding additional property to be acquired under its terms; specifically, to finance the Light Emitting Diodes (LED) Traffic Signals Project through the terms of the lease.**

**NOW, THEREFORE, BE IT RESOVED by the City Council of the City of Hayward that the City Manager is hereby authorized to execute an amendment to the Agreement to include the LED Traffic Signals Project, and to take all necessary action in furtherance thereof, in a form and manner to be approved by the City Attorney.**

**IN COUNCIL, HAYWARD, CALIFORNIA \_\_\_\_\_, 1998**

**ADOPTED BY THE FOLLOWING VOTE:**

**AYES:**

**NOES:**

**ABSTAIN:**

**ABSENT:**

**ATTEST:** \_\_\_\_\_  
City Clerk of the City of Hayward

**APPROVED AS TO FORM:**

\_\_\_\_\_  
City Attorney of the City of Hayward

# DRAFT

HAYWARD CITY COUNCIL JB 1/22/98

RESOLUTION NO. \_\_\_\_\_

Introduced by Council Member \_\_\_\_\_

**RESOLUTION AUTHORIZING THE CITY MANAGER TO EXECUTE AN AMENDMENT TO THE AGREEMENT WITH VIRON ENERGY SERVICES PROVIDING FOR A PERFORMANCE BASED GUARANTEED ENERGY PROGRAM**

WHEREAS, the City of Hayward entered into an agreement with Viron Corporation, dated November 15, 1996, for the purpose of participating in a Performance Based Energy Program; and

WHEREAS, the City Council of the City of Hayward now desires to amend the agreement to expand the scope of work to include a Light Emitting Diodes Traffic Signal Project.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Hayward that the City Manager is hereby authorized and directed to execute on behalf of the City of Hayward an amendment to the agreement between the City of Hayward and Viron Energy Services to expand the scope of work, in a form and manner to be approved by the City Attorney.

IN COUNCIL, HAYWARD, CALIFORNIA \_\_\_\_\_, 1998

ADOPTED BY THE FOLLOWING VOTE:

AYES:

NOES:

**ABSTAIN:**

**ABSENT:**

**ATTEST:** \_\_\_\_\_  
City Clerk of the City of Hayward

**APPROVED AS TO FORM:**

\_\_\_\_\_  
City Attorney of the City of Hayward