

**CITY OF OAKLAND
AGENDA REPORT**

FILED
OFFICE OF THE CITY CLERK
OAKLAND

TO: Office of the City Manager
ATTN: Deborah Edgerly, Interim City Manager
FROM: Public Works Agency
DATE: July 22, 2003

2003 JUL 10 PM 3:20

RE: RESOLUTION TO APPROPRIATE \$419,011.90 IN ELECTRO-TEST, INC. INCENTIVE MONEY AND \$212,400 IN GRANT AND REBATE MONEY FOR TRAFFIC CONTROL SIGNAL BATTERY BACKUP SYSTEMS AND ENERGY EFFICIENCY PROJECTS

SUMMARY

A resolution has been prepared authorizing the City Manager to appropriate a total of \$631,411.90 for the following projects:

- Add battery backup systems to nine traffic control signals.
- Retrofit approximately 980 traffic signal lamps to LEDs.
- Retrofit approximately 1,350 streetlights with electronic ballasts.
- Provide timely design assistance for capital improvement projects.

Most of the funding for this appropriation is derived from incentives to the City for converting 8,500 red traffic signal lights to low energy, light emitting diodes (LEDs) instead of incandescent lamps. This project was completed in conjunction with an agreement with Electro-Test, Inc. (ETI) per Resolution No. 74374 C.M.S. approved in July 7, 1998. Additional funding for these projects is derived from grants and anticipated rebates resulting from the completion of the project.

FISCAL IMPACT

The resolution appropriates \$631,411.90 as indicated in Table 1 below. Some of these projects will receive supplemental funding from incentives and grants. Detailed project budgets are provided in Attachment A.

**Table 1
Estimated Fiscal Impacts of Traffic Control Signal and Energy Efficiency Projects**

Activity	Total Cost	Funding Request	Grant Or Rebate	Grant Or Rebate Source	Annual Avoided Energy Cost
Battery backup for nine traffic control signals	\$61,400.00	\$39,000.00	\$22,400	CEC	None
Year 2003 LED retrofits	\$177,000.00	\$130,000.00	\$47,000	PG&E	\$75,000
Street and area lighting demonstration	\$339,000.00	\$196,000.00	\$143,000	CPUC	\$34,000
Design assistance for energy efficiency on City facilities	<u>\$54,011.90</u>	<u>\$54,011.90</u>	0	None	<u>Uncertain</u>
Total	\$631,411.90	\$419,011.90	\$212,400		\$109,000 or greater

Item #: 12
Public Works Committee
July 22, 2003

BACKGROUND

Electro-Test Incentives and Prior LED Retrofits

On July 7, 1998, Resolution No. 74374 C.M.S. authorized the City Manager to enter into an agreement with ETI, to provide monetary incentives for the City to convert approximately 8,500 incandescent traffic signal lamps to low energy LED lights. Under the terms of the agreement, ETI provided the City with annual incentive payments totaling \$419,011.90 from July 1999 until their final payment in May 2003. Incentive funds have been received and are accounted for in Project C95310, the fiscal origin of all LED project work.

The project was financed by a lease from Bank One. The final balance of the lease will be paid off in July 2003 using unspent lease proceeds. Therefore, ETI incentive funds are not needed to repay the lease.

Alameda County and other government agencies are using re-investment strategies with rebates. The Electrical Division (ED) proposes to follow suit and continue generating more benefits through energy efficiency projects. To determine the best re-investment strategy for energy efficiency incentives, the ED looked for projects that had high impacts related to public safety, timeliness, or cost savings.

Battery Backup Systems for Traffic Control Signals

LED traffic lights have dramatically reduced energy used by traffic control signals. The CEC and the City have both seen a new opportunity to improve public safety and reduce traffic congestion during power failures by adding batteries to high volume or high-risk intersections. Therefore, on March 18, 2003, the CEC awarded the Public Works Agency a grant in the amount of \$22,400 for a project to add battery backup systems to the following nine intersections: Brush and 18th Street; Brush and 12th Street; Castro and 11th Street; Castro and 17th Street; Hegenberger and I-880; International Boulevard and 73rd Avenue; International Boulevard and 98th Avenue; Bancroft and 73rd Avenue; and Broadway and 14th Street.

Year 2003 LED Retrofit Project

In 1999 and 2001, the City converted a total of approximately 13,700 red and green traffic signal lamps from incandescent to LED products. However, we could not retrofit approximately 850 limited visibility traffic signal lamps¹ because there was not a CalTrans-approved product available. Yellow traffic signal lamps were not cost-effective retrofit candidates due to their very short period of operation (they are still not cost-effective today). However, 130 flashing yellow beacons were inadvertently overlooked. Flashing yellow beacons are good retrofit opportunities due to their long periods of operation. Therefore, additional LED retrofits are a timely opportunity to further reduce energy costs.

¹ Lamps with very controlled visibility so that drivers know to respond to the correct signal without distraction from other adjacent signals, e.g. northbound 980 Freeway off ramp at the intersection of 11th and Castro Streets.

The total cost to perform these additional LED retrofits is \$177,000, of which \$47,000 is dependent upon a future rebate. To the extent that the rebate portion is not received, staff will decrease the number of additional LED retrofits.

Street and Area Lighting Demonstration (SALD) Program

There is an opportunity to make streetlights 11 to 21 percent more energy efficient by converting their ballasts to electronic products.² Streetlight rates are fixed without any variation in cost due to actual consumption.³ Therefore, no financial incentives exist to encourage reducing energy use. Although California has approximately 1.4 million streetlights, no manufacturer is known to make a highly efficient product that is suitable for routine use in streetlights, and no other cities are known to be working on a similar effort.

Extrapolating the estimated benefits of electronic ballast conversions to all of the City's nearly 36,000 streetlights (of various sizes) yields the following approximated results, assuming that the technology becomes commercially available at low cost on a large scale:

Avoided Energy Consumption:	5.2 million kWh per year
Implementation Cost:	\$2.1 million
Avoided Energy Cost (at today's rates):	\$670,000 annually

In response to the situation above, the City of Oakland and Quantum Consulting (Berkeley) applied to the California Public Utilities Commission (CPUC) and received a \$143,000 grant to:

- 1) Test the benefits of energy efficiency measures for streetlights.
- 2) Work with PG&E to develop rates that reduce street lighting costs for energy efficient products.

Design Assistance for Capital Improvement Projects

The City began practicing design assistance in 1990 by reviewing plans for City facility projects and recommending ways to make cost-effective energy efficiency improvements. We focused on new building and retrofit projects, primarily looking for opportunities to improve lighting and heating systems.

The City Administration Building project presented an opportunity to take design assistance to a new level. The City, in collaboration with the California Energy Commission (CEC), Eley Associates and the Energy Foundation refined the scope for this design-build project to create and use computer models to hold the design-build team financially responsible for achieving a specific energy efficiency target.

² Ballasts control electricity delivered by PG&E distribution lines to properly start and operate street light lamps.

³ Street lighting energy is not typically measured, or "metered" because meter installation, maintenance, reading and billing costs would be quite significant relative to the cost of energy used by each streetlight. Therefore, rates are based on test results for typical products. Customers pay a flat monthly fee regardless of how much energy is actually used by their particular street lighting equipment.

Using the actual energy consumption patterns for the second year of occupancy, Eley Associates determined that the finished buildings were about 3% more energy efficient than the target, yielding a project that was about 27% better than required by Title 24, California's progressive energy code. The CEC presented the City an award for outstanding achievement in energy efficiency for the project.

In 2001, the City began offering technical assistance for private sector projects through the Community and Economic Development Agency, using a grant from the CPUC. The 2001 Energy Efficiency Design Assistance program is expected to avoid an estimated 322 kilowatts (kW) of peak energy consumption and 1.8 million kilowatt-hours (kWh) per year. More recently, the City teamed up with the Department of Energy and Lawrence Berkeley National Laboratory to collaborate with the Port of Oakland on plans to expand their Terminal II.

KEY ISSUES AND IMPACTS

Re-investing the ETI incentive money will aid the City in achieving its goals of reducing its energy consumption and minimizing greenhouse gas production while continuing to make progress toward the City's Sustainable Community Development Initiative goals. Each of the projects funded by the proceeds of the ETI incentive would either improve traffic safety or energy efficiency.

Battery Backup Systems for Traffic Control Signals

Adding battery backup systems to traffic control signals will further improve their reliability⁴ and should create corresponding improvements in safety for vehicles and pedestrians.

In order to receive \$22,400 of grant funding from the CEC, the systems must be completely installed by December 31, 2003.

Year 2003 LED Retrofit Project

Implementing the Year 2003 LED Retrofit project will capture all known cost-effective opportunities for energy efficiency in traffic control signals. Once this project is complete, all red and green traffic signal lamps, all red pedestrian hand signals and all flashing yellow beacons in Oakland will be LED products.⁵

There is no critical deadline for completing this project. However, prompt completion is recommended due to the estimated \$6,000 per month of savings in energy costs.

Street and Area Lighting Demonstration Program

At any given time, the City of Oakland is striving to take a leadership role in at least one new area of energy efficiency exploration, such as this demonstration project. The City is collaborating with Lawrence Berkeley National Laboratory to run a program that creates results and lessons that are valuable to many other cities.

⁴ LED lamps last several times as long as incandescent lamps, significantly improving their reliability.

⁵ Yellow lamps, except for flashing beacons, and the walking pedestrian indicator are not cost effective conversions at this time.

In order to receive an estimated \$143,000 of grant funds, the City must complete the installation phase of this project by December 31, 2003. The City is actively negotiating with PG&E to develop a street lighting rate that will avoid an estimated \$34,000 of energy costs for this project. Actual savings will depend on the negotiated results.

Design Assistance for Capital Improvement Projects

The development, budgeting and schematic design phases of projects are the critical times when the most important decisions are made regarding energy efficiency and sustainability issues. These are also the times when the ED has the most limited access to funding for computerized modeling and specialized technical assistance. Access to the requested funds will improve the timeliness and therefore results of technical assistance for energy efficiency on significant City projects.

For example, the potential new Police Administration Building is a great candidate for early computer modeling to determine which building configurations and products will yield the optimal blend of technologies and construction methods. Ready access to funds will allow staff to provide timely information that keeps pace with a rapidly solidifying project scope and budget.

PROGRAM DESCRIPTION

The resolution authorizes the appropriation of funds to complete the energy projects outlined below. In some cases, the rebate money will supplement the funding of projects for which the ED has already been awarded grant funding. Please see *Attachment A* for program budgets.

Battery Backup Systems for Traffic Control Signals

During an electrical power outage, the battery backup systems would continue providing electricity to the traffic control signals at the locations indicated for approximately four hours and then recharge for another two hours operation after 24 hours. The actual duration of operation will vary as the batteries age.

The project's scope of work includes new battery backup installations to nine intersections located throughout the City of Oakland. Additionally, batteries will be warranted for a full replacement for two years.

Street and Area Lighting Demonstration (SALD) Program Project

This program is an opportunity to optimize the energy efficiency of a trial batch of 1,350 nominal 150-watt High Intensity Discharge (HID) streetlights, using approximately 155-watts instead of 202 Watts per fixture. In aggregate, the completed project will avoid an estimated 269,000 kWh per year. The City and PG&E are working on a special electricity rate that recognizes the higher efficiency and reduces the monthly cost per lamp accordingly. This revised rate is expected to save an estimated \$34,000 per year in electricity costs for the trial batch of 1,350 lights.

Year 2003 LED Retrofit Project

This project further enhances existing LED installations by converting lamps in 130 yellow flashing beacons, 425 red limited visibility indications and 425 green limited visibility indications. A PG&E rebate will fund the project in part; the appropriation would fund remaining construction costs estimated at \$130,000.

Design Assistance for Capital Improvement Projects

This activity will use \$54,011.90 to provide rapid response design assistance on City projects in their earliest stages of development, when optimal results are possible. Term agreements are envisioned with consultants who can provide computer modeling and specialized engineering assistance on short notice. This approach will avoid placing a fiscal burden on design teams when the budget is not certain, yet allow City staff to assess opportunities and provide input to projects at the most critical time.

The proposed funds would be spent in efforts to maximize energy efficiency, minimize greenhouse gas production and generally recover investments in seven years or less. In the case of the proposed new Police Administration Building, it is not yet certain exactly what will be found, but if past experience holds true, significant opportunities are likely and early intervention is the key to keeping first costs down. For example, a rough energy budget for a 250,000 square foot hypothetical Police Administration Building might be \$2.00 per square foot per year. Reducing its energy consumption by 20% would avoid about \$100,000 per year and justify a premium capital expense of roughly \$700,000.

SUSTAINABLE OPPORTUNITIES

The energy projects identified in this report will further optimize energy efficiency in City of Oakland facilities. Implementing these projects also improves progress toward the City's Sustainable Community Development Initiative goals by reducing electricity demand, energy consumption, and greenhouse gas production.

DISABILITY AND SENIOR CITIZEN ACCESS

The proposed projects will not affect disability or senior citizens' access requirements.

RECOMMENDATION AND RATIONALE

Staff recommends that City Council approve this resolution authorizing the City Manager to receive and appropriate \$631,411.90 in incentive rebates and grant funding for traffic control signal battery backup systems and energy efficiency projects. These projects will save the City an estimated \$109,000 per year in energy costs (pending the outcome of rate negotiations with PG&E) reduce greenhouse gas emissions, and improve traffic safety and flow during electricity outages.

ACTION REQUESTED OF THE CITY COUNCIL

The Council is requested to approve this resolution.

Respectfully submitted,



CLAUDETTE R. FORD
Director, Public Works Agency

Reviewed by:
Raul Godinez II, P.E.
Assistant Director, Public Works Agency

Prepared by:
Scott Wentworth, P.E.
Energy Engineer

APPROVED AND FORWARDED TO
THE PUBLIC WORKS COMMITTEE:



OFFICE OF THE CITY MANAGER

Budget Estimates for Proposed Energy Projects

Battery Backup Systems for Traffic Control Signals Budget

Implementation	
Construction	\$15,000
Project Administration and Design	\$ 6,400
Products and Materials	\$40,000
Total Project Costs	\$61,400

SALD Program Budget

Implementation	
Construction and Materials	\$140,000
Engineering and Product Testing	\$149,000
Project Administration	\$ 50,000
Total Project Costs	\$339,000
Annual Energy Cost Avoided	\$34,000
Simple Payback Period	5.8 years

Year 2003 LED Retrofit Budget

Implementation	
Construction and Materials	\$161,000
Project Administration	\$16,000
Total Project Costs	\$177,000
Annual Energy Cost Avoided	\$75,000
Simple Payback Period	1.7 years

Design Assistance for Capital Improvement Projects

Implementation	
Professional Services	\$54,011.90
Staff Participation Cost	To be determined
Total Project Costs	Uncertain at this time
Annual Energy Cost Avoided	Uncertain at this time

FILED
OFFICE OF THE CITY CLERK
OAKLAND

OAKLAND CITY COUNCIL
RESOLUTION No. _____

2003 JUL 10 PM 3:21
C.M.S.



INTRODUCED BY COUNCILMEMBER _____

**RESOLUTION, TO APPROPRIATE \$419,011.90 IN ELECTRO-TEST, INC.
INCENTIVE MONEY AND \$212,400 IN GRANT AND REBATE MONEY FOR
TRAFFIC CONTROL SIGNAL BATTERY BACKUP SYSTEMS AND
ENERGY EFFICIENCY PROJECTS**

WHEREAS, using the Electro-Test, Inc. (ETI) incentive money and grant money will aid the City to achieve its goals of completing energy efficiency projects, reducing its energy consumption, and improving cost effectiveness. Continuing to work toward these goals will aid in making progress toward the City's Sustainable Community Development Initiative goals; and

WHEREAS, the City Council approved Resolution No. 74374 C.M.S., adopted July 7, 1998, which authorized the City Manager to enter into an agreement with ETI to provide monetary incentives for the City to covert traffic signal lights to low energy using lamps; and

WHEREAS, the City obtained these incentives, by converting its approximately 8,500 red traffic signal lights to a new energy saving lamp that uses light emitting diodes (LEDs) instead of incandescent lamps. The City has received all of the incentive payments outlined in the five-year agreement, totaling \$419,011.90; and

WHEREAS, the Public Works Agency now requests that Council appropriate and approve the spending of the ETI incentive money to fund and supplement the energy projects outlined below. Additionally, the Energy Section has also been awarded grant funding to further supplement some of the energy projects; and

WHEREAS, the appropriation would fund implementation costs for the *Battery Back-Up System for Traffic Control Signals* project, estimated at \$61,400, including grant funds received from the California Energy Commission; and

WHEREAS, the appropriation would fund implementation costs for the *Year 2003 LED Retrofit* project, estimated at \$177,000, including Pacific Gas & Electric rebate funds. This project will reduce the City's energy costs by an estimated \$75,000 per year at today's rates; and

WHEREAS, the appropriation would fund implementation costs for the *Street and Area Lighting Demonstration Program*, estimated at \$339,000, including a California Public Utilities Commission rebate through the Oakland Energy Partnership. This project may reduce the City's energy costs by an estimated \$34,000 per year at today's rates, depending on the outcome of special rate negotiations with PG&E; and

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WHEREAS, an appropriation of \$54,011.90 for *Design Assistance For Capital Improvement Projects* would fund part of the cost for very timely use of specialized energy consultants and staff who provide detailed analysis and specialized advice for maximizing the life-cycle cost-effectiveness of energy efficiency measures in capital improvement projects such as the proposed new Police Administration Building; and

WHEREAS, the proposed projects will save the City an estimated \$109,000 annually, depending on the outcome of special street lighting rate negotiations with PG&E; now, therefore, be it

RESOLVED: That the City Manager is authorized to receive and appropriate the spending of the Electro-Test, Inc. incentive funds in the amount of \$419,011.90 and \$212,400 in anticipated grant and rebate funds for the work identified as: *Battery Back-Up System for Traffic Control Signal; Year 2003 LED Retrofits; Street and Area Lighting Demonstration Program; and Design Assistance for Capital Improvement Projects*; and be it

FURTHER RESOLVED: That the City Attorney has approved this resolution, and a copy is on file in the City Clerk's Office.

IN COUNCIL, OAKLAND, CALIFORNIA, _____, 20 _____

PASSED BY THE FOLLOWING VOTE:

AYES- BROOKS, BRUNNER, CHANG, NADEL, QUAN, REID, WAN AND
PRESIDENT DE LA FUENTE

NOES-

ABSENT-

ABSTENTION-

ATTEST: _____
CEDA FLOYD
City Clerk and Clerk of the Council
of the City of Oakland, California

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