Agenda Item #:______________________________

Staff Report
City of Manhattan Beach

TO: Honorable Mayor Montgomery and Members of the City Council

THROUGH: Geoff Dolan, City Manager

FROM: Jim Arndt, Director of Public Works
Michael A. Guerrero, Principal Civil Engineer

DATE: October 7, 2008

SUBJECT: Status Report on the City Council Work Plan Item Regarding the Gas Lamp Conversion Feasibility Study

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RECOMMENDATION:
Staff recommends that the City Council review this report and refer the issue to the Environmental Task Force for consideration along with other strategies for reducing the City's carbon emissions.

FISCAL IMPLICATION:
There are no fiscal implications associated with the recommendation of this status report.

BACKGROUND:
As part of the current fiscal year's Council Work Plan, staff was directed to investigate the feasibility of converting the gas lamps in the three gas lamp districts to electrical lights. There are three gas lamp districts within the City as shown on the attached map (see attached Exhibit D). The three districts are known as the 31st Street District, 13th Street District, and the Marine District. All told, there are 115 gas lamps between the three districts. Combined, the three districts consume a total of $36,000 a year worth of natural gas. This represents 2.9% of the City's equivalent carbon emissions (based on calculations in the City's Green Team Report).

Conventional Hardwired Electric Conversion Cost

To convert the gas lamps to conventional electrical lights, the electrical poles and fixtures would cost approximately $1,300 each. The poles would be standard Marbelite concrete poles (see attached Exhibit A), similar to street light poles found throughout the City. The poles would be 11 feet in height (existing poles are steel and vary in height from 8' at Marine District, 9' at 31st Street District, 10' at 13th Street District). The actual incandescent light fixture proposed (see attached Exhibit B) is a standard off-the-shelf fixture that mimics the existing gas lamp fixtures. The pole and fixture were selected for the purpose of cost estimates. If the City Council directs staff to proceed with the conversion then community input would be sought to determine actual pole and light fixtures.

To power the electrical lights, the City would have to install underground electrical conduits. The conduit and wiring is the most expensive part of the conversion process. As noted in Table A below, the cost to convert all three districts to electrical lamps would be approximately $975,000. This alternative will also require an estimated $75,000 for removal of the existing gas lamps/poles and abandonment of the associated gas service to each lamp. Thus the total cost for this alternative is estimated at $1,050,000.

Table A

	# of Poles	Pole/Fixture	Conduit(1)	Total
Marine District	85	$110,500	$579,500	$690,000
31st Street District	26	$ 33,800	$226,200	$260,000
13th Street District	4	$ 5,200	$ 19,800	$ 25,000
Subtotal				$975,000
Removals				$ 75,000
Total				$1,050,000

(1)includes trenching, permanent resurfacing, conduit, conductors, cabinets, design, contract administration, and 10% contingency.

Another alternative for conversion to electrical lighting is rather than replace the existing gas lights "one for one" with similar decorative poles and electrical fixtures, to remove the existing gas lights and replace with traditional standard streetlights with 25-foot marbelite poles and mast arm mounted lights similar to the lighting in adjacent areas and citywide as a whole. The pole, mast arm, and luminaire are estimated at $10,000 each. Existing standard streetlights within the gas lamp districts would be augmented with additional installations of poles and mast arm lights per Table B to approximate the lighting pattern of the adjacent neighborhoods.

Table B

	# of Poles	Pole/Fixture	Conduit(1)	Overhead	Total
Marine District	18	$180,000	$250,000	$ 0	$430,000
31st Street District	4	$ 40,000	$ 60,000	$ 10,000	$110,000
13th Street District	1	$ 10,000	$ 0	$ 5,000	$ 15,000
Subtotal					$555,000
Removals					$ 75,000
Total					$630,000

(1)includes trenching, permanent resurfacing, conduit, conductors, cabinets, design, contract administration, and 10% contingency.

In this circumstance this electrical alternative generally will require underground conduit to service the new streetlights since existing overhead electrical wires are not located along the alignment of the new streetlights. This alternative will also require an estimated $75,000 for removal of the existing gas lamps/poles and abandonment of the associated gas service to each lamp. Thus the total cost for this alternative is estimated at $630,000. Since the streetlights for this alternative are substantially different than the existing gas lamps staff anticipates the most neighborhood resistance in this case and locations of the new streetlights will also be a critical issue.

Solar Power Option

Most solar-powered lighting systems consist of three elements: collectors, batteries, lighting source (LED, incandescent lamps, etc.). While researching different options, staff came across a solar street light pole installation at the City of Monrovia. This light, as depicted in Exhibit C, was installed at the City of Monrovia's city hall parking lot. In today's prices, it would cost approximately $5,000 per pole to install the street light. This street light is completely independent of Southern California Edison's power grid. The only maintenance to date in the past four years has been re-lamping of the light. While the City of Monrovia is satisfied with the lighting level provided by this street light pole, no further installations were made in the public right-of-way as the City Council was concerned with the aesthetics of the installation. As the photographs in Exhibit C depict, one of the main constraints in typical stand-alone solar-powered lights is the size of the collector required to power the light.

A solar lighting alternative replacing all 115 gas lamps with decorative solar lights/poles is estimated at $575,000 for the solar lights/poles and $75,000 for removal of the existing gas lamps for a total estimated cost of $650,000.

DISCUSSION:

Electric Conversion

As discussed, conversion of the gas lamps to conventional electrical lights is estimated at $1,050,000 for decorative lights and $630,000 for standard streetlights for capital costs which does not include annual operating costs. Based on the City's Green Team Report which estimates that a single gas lamp emits approximately six times more CO_2 emissions than a high pressure sodium streetlight then the equivalent carbon emissions would be reduced from 2.9% for gas lamps to 0.5% for decorative electric lights and to 0.2% for standard electrical streetlights. As technologies improve there may be other ways to reduce equivalent carbon emissions in the near future with additional research and product development.

Solar Conversion

Staff investigated installing solar lights with industry representatives and light fixture manufacturers to identify a solar-powered light that might be an appropriate replacement for the existing gas lights. Staff's research and selection has been focused on lights that somewhat mimic what is existing in the Gas Lamp Districts. Typically these solar lamps utilize LED bulbs to cut down on the power consumption. The battery may be included in the base of the lamp and the solar panels may be built into the fixture. However, staff does have the following concerns with an installation of this nature:

1. While the light manufacturers typically state that the light produced is equivalent to a 75W bulb, the lighting pattern only extends a few feet from the base of the pole. Staff questions whether this would be an acceptable level of lighting for the residents living within the Gas Lamp Districts.

2. The manufacturer does not guarantee the hours of time that lighting levels would be maintained on one daylight charge. In discussions with industry representatives, it was pointed out that during the winter months when the days are shortest and the nights are longest, the lamps would have less time to recharge and would be expected to produce light over a longer period of time. This could give rise to the amount of time that appropriate lighting levels need to be provided and may potentially create durations of time where lighting is not provided. As discussed, the size of the collector is important to the reliability of the solar light, however, this is the opposite goal of making the solar light aesthetically decorative.

3. The actual location of these solar-powered lights may have to vary from the location of the existing gas lamps if the site investigation indicates that the new installation would be shaded because of adjacent trees, etc.

4. While the intent of the conversion is to select an alternative light fixture that mimics the existing gas lamps, Gas Lamp District residents may be resistant to change of the fixture and the quality (LED, incandescent versus gas) and quantity of light.

SUMMARY:
The following table represents a summary of the various costs, environmental issues, and neighborhood aesthetics associated with the three alternatives investigated.

	Capital Costs	Annual Operating Costs	Equiv CO_2 (%)	Expected Neighborhood Resistance [1]
Existing Gas	$ 0	$36,000	2.9%	0
Electrical (Decorative)	$1,050,000	$ [2]	0.5%	8
Electrical (Standard)	$ 630,000	$ [2]	0.2%	10
Solar	$ 650,000	$ 0	0.0%	8

[1] "Neighborhood Resistance" is a subjective variable that is given a ranking from 0 to 10 (10 being greatest resistance); the rankings shown are staff's estimate and not a statistical survey of affected residents

[2] This information was not yet available to be included in this report; Staff is working with SCE to determine the Annual Operating Costs based on sample fixture specifications and SCE lighting rate schedules

The existing use of gas lamps in the City's three gas lamp districts is a significant source of carbon emissions for the City. However, replacing the current gas lamps with a similar looking electrical option will be expensive, and other options such as solar powered lamps or standard street lighting may change the character of the districts. Staff recommends that the City Council refer this issue to the Environmental Task Force for consideration along with other strategies for reducing the City's carbon emissions.

Attachments: A. Sample Fixture Detail
B. Sample Pole Detail
C. City of Monrovia Solar Light
D. GIS Location Map

AMERON INTERNATIONA
Pole Product Divisi

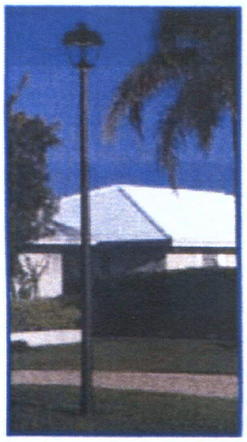
Product Catalog: Round Poles

Centrecon Series

Click Here for print version.

"S" Small Round Pole

Ameron Centrecon Series "S" prestressed concrete lighting poles provide the light pattern required for shopping centers, parking lots, green belts or other areas requiring decorative and roadway lighting. Application can be post top, mast arm or side mounted. These strong, durable poles are available in various aggregates and finishes.



General Information

Ameron´s Centrecon Series poles are symmetrically tapered spun-cast, prestressed concrete shafts for either base mounted or embedded installations to provide dense, high strength, centrifugally cast concrete with high-tensile, solid steel prestressing wires, uniformly wrapped with spiral welded wire cage at a controlled pitch for torsional reinforcement. Ameron poles conform to applicable sections of ACI, AASHTO, ASTM, and UBC standards.

Surface Treatment

The concrete shafts are lightly blasted to expose the texture and beauty of the natural and terrazzo aggregates while maintaining sharp definition of details and patterns.

Colors and Finishes

Standard, pre-formulated and custom aggregate colors are available. See separate aggregate sheet for details. Ameron offers Amershield™, a premium graffiti-resistant coating, plus an assortment of durable sealers and protectants that further enhance colors, protect the concrete surface and aid in the removal of graffiti.

Exhibit A

SALEM AREA LIGHTING

SALEM™ TOP MOUNTED LAMP

APPLICATIONS
- Residential areas and walkways
- Shopping centers and malls

SPECIFICATION FEATURES
- UL / cUL 1598 listed when Polycarbonate refractor (TL) is used and "**U**" option is chosen
- Standard construction is IP54
- Die Cast aluminum housing
- Cutoff optics available
- Stainless steel catch to avoid hinge breakage
- Acrylic or Polycarbonate textured refractors, clear glass panels, or flat glass for cutoff distributions
- Integral ballast in top of luminaire
- Top socket
- Stainless steel latch to secure canopy
- Terminal board standard
- Plug-in ignitor
- No-tool PE receptical

ORDERING NUMBER LOGIC

SEMT PRODUCT IDENT	10 WATTAGE	S LIGHT SOURCE	1 VOLTAGE	N BALLAST TYPE	1 PE FUNCTION	TA REFRACTOR	MC2 IES DISTRIBUTION TYPE	BLCK COLOR	XXX OPTIONS
XXXX	XX	X	X	X	X	XX	XXX	XX	XXX
SEMT = Salem Luminaire	05 = 50 07 = 70 10 = 100 15 = 150 17 = 175	S = HPS M = MH T = INDUCTION	0 = Multivolt 1 = 120 2 = 208 3 = 240 4 = 277 5 = 480 D = 347 F = 120X347	See Ballast and Photometric Selection Table A = Autoreg H = HPF Reactor or Lag N = NPF Reactor or Lag T = Induction Ballast	1 = None 2 = PE Receptacle 4 = Shorting Cap 5 = PE in box	TA = Textured Acrylic Refractor TL = Textured Lexan Refractor CA = Clear Acrylic Side Panels CL = Clear Lexan Side Panels FG = Flat Glass Upper Lens CG = Clear Glass Side Panels	S = Short M = Medium C = Cutoff S = Semi-cutoff N = Non-cutoff 1 = Type 1 2 = Type 2	WHTE=White BLCK=Black DKBZ=Dark Bronze GRAY=Gray (ecoat only) ALUM=Aluminum FGRN=Forest Green CHGR=Charcoal Gray XXXX=RAL Number	F = Fused U = UL / cUL available only with TL refractor (ballast in bottom) P = Prewire with 6' of 14/3 cable
SEMT	05	S	1	N	2	TA	MS2	BL	

GE Lighting Systems, Inc.
www.gelightingsystems.com

Exhibit B

Gas Lamp Conversion Feasibility Study – Exhibit C

Gas Lights

in the

City of Manhattan Beach

Exhibit D