



Memorandum

TO: TRANSPORTATION AND
ENVIRONMENT COMMITTEE

FROM: James R. Helmer

SUBJECT: Public Streetlighting Policy
Number 4-2

DATE: November 17, 2008

Approved

Date

11-20-08

COUNCIL DISTRICT: City-Wide

SNI AREA: n/a

RECOMMENDATION

1. Recommend to City Council that the City Council adopt a resolution to replace the current Streetlight Conversion Policy (Council Policy Number 4-2) with the proposed revised policy in its place.

OUTCOME

A recommendation by the Transportation and Environment Committee ("Committee") to the City Council to adopt a resolution to replace the existing Council Policy Number 4-2 with a new Council Policy 4-2. The new policy would allow the City of San Jose to substantially reduce its operating and maintenance costs for public streetlights and pedestrian lights, help address the City's energy and hazardous waste reduction goals, and provide the means by which the City can strive to meet its goal, as identified in *San Jose's Green Vision*, to "replace 100 percent of its streetlights with smart, zero emission lighting" by 2022.

BACKGROUND

At its October 6 meeting, the Committee directed staff to continue to coordinate development of a new public streetlighting policy with key stakeholders and return to the Committee in December with a final draft for consideration. Staff presented the proposed policy to the Developer's Roundtable in late October and the Developers' Industry Representatives Roundtable in November. The first group is convened by the Planning, Building and Code Enforcement Department the second by the Public Works Department. Reaction to the proposed policy, particularly the energy cap, was mixed. Some developers were pleased to hear that the City was considering changing its policy to allow streetlights that cast a white light for at least a portion of the evening (unlike the yellow sodium-vapor lights currently in use). Others were unhappy about how the proposed energy cap would be executed. More detail is provided in the Public Outreach/Interest portion of this memo. Staff also engaged in discussions with the

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Redevelopment Agency about the policy and reached out to Lick Observatory for comment. Their recommendations are reflected in the policy.

Staff also continued to test "smart," energy-efficient Light Emitting Diode (LED) streetlight fixtures that are consistent with the proposed policy. In mid-October the City released a Request for Proposals (RFP) to purchase 100 "smart, programmable streetlights" funded by a federal Community Development Block Grant (CDBG). If a proposer is selected, these lights, which are planned to be installed in the Spring of 2009, will be the City's first purchase of "solid state" streetlights that comply with the proposed policy. Solid state lights use semiconductor diodes to generate light, rather than a vacuum or gas tube. Their design permits enhanced control of the light source, such as its color, intensity, and pattern of illumination.

Lighting technology is improving rapidly, fueled by concerns about energy consumption and climate change as well as technological breakthroughs. By early next year, the Department of Energy will be certifying LED solid state streetlights through its Energy Star program. The program certifies products that meet superior energy efficiency ratings. Staff anticipates it may be another year before the type of lighting fixtures called for in the new policy become widely available. That is why the policy includes an 18-month transition period. By adopting the proposed public streetlighting policy now, the City can help drive that innovation and take advantage of lighting improvements as they become available.

Adopting a new policy also gives the City another, more palatable option than shutting off streetlights. This fiscal year, facing a then-anticipated three-year budget deficit exceeding \$100 million and a \$3.5 million and growing annual streetlight electrical bill, the City Council approved staff's recommendation to shut off 900 of the City's 62,000 streetlights. The City was one of a number of municipalities across the country from Belmont, Massachusetts to Santa Rosa, California that shut off or considered shutting off its street lights this year to save money. Other cities are considering installing new, more energy-efficient solid-state lights or are looking at dimming a portion of their lights to reduce their costs. Neither of those strategies is available to San Jose under its current public streetlighting policy.

Maintenance costs for City streetlights are also high due to the fact that the lights in use are relatively short lived (approximately four years) and their photocell sensors (small, light-sensing components designed to turn the light on and off in relation to available sunlight) are not always reliable. The City also pays a premium for its most widely deployed streetlight, low-pressure sodium, because it is one of only a handful of cities in the nation that purchases the light. And, every year the City adds new streetlights to its inventory through capital improvements and private developments.

To develop a more effective strategy to reduce the City's streetlight operating and maintenance costs, the Department of Transportation convened a technical lighting committee that met over a six month period beginning in late 2007. The committee included the Lick Observatory, lighting manufacturers and distributors, Pacific Gas and Electric Company (PG&E), and staff from the Redevelopment Agency, Environmental Services Department, and Public Works Department. Those discussions laid the foundation for the new public streetlight policy.

1980 Streetlight Conversion Policy:

Energy conservation, lighting quality, and protecting the night sky are three primary concerns the City Council has long sought to balance in its public streetlighting policy. The 1980 Streetlight Conversion Policy (Council Policy Number 4-2) switched all of San José's mercury vapor and incandescent streetlights to sodium vapor to decrease the City's energy consumption. Later amendments to the 1980 policy specified where low- and high-pressure sodium vapor lights, and eventually metal halide pedestrian lights, could be used.

Low-pressure sodium (LPS) is more energy efficient than high-pressure sodium (HPS), but it casts a yellow light with poor color rendition: it is difficult to distinguish the true color of objects under LPS. Critics of LPS say it is difficult to identify a parked car lit by LPS, distinguish between yellow or red curbs, or easily recognize a business logo. The business community and safety personnel favored HPS, which they felt created a more appealing nighttime environment for pedestrians and motorists. HPS emits a warm white light that renders colors more accurately. However, Lick Observatory on Mount Hamilton preferred LPS because it could more easily filter out the narrow range of wavelengths LPS casts into the sky improving astronomical viewing.

Initially the City converted lighting on signalized intersections and on minor arterials to HPS, except those within nine miles of Lick Observatory. In January 1982 the Council modified the City's policy and expanded the use of LPS throughout the City. The exception was in the downtown core. The City Council specified that HPS be used exclusively in the downtown core in deference to concerns expressed by the business community and public safety personnel.

As the City's downtown grew and the Arena was built, the demand for more HPS lights increased. The City's amendments to its 1980 Streetlight Conversion Policy in the three following decades (in 1982, 1989, 1996, 2003, and 2006) sought to balance the competing needs of Lick Observatory with those of the business community and neighborhoods. The City gradually expanded the areas where HPS were permitted but within tight confines. With the exception of the Greater Downtown, the majority of the City continues to be lit with LPS.

In 1991 the City adopted a resolution establishing lighting standards for all new public streetlight installations. Resolution No. 63396 referenced the "American Standard Practice for Roadway Lighting" issued by the Illuminating Engineering Society (IES) in 1964 that specifies design levels for the amount of light, or lumens per square foot, that streetlights should cast on different types of roadways. The design guideline is used by City staff to determine the wattage and spacing of streetlights in new developments as well as redevelopments. The guideline assumes that lights are lit at full power the entire evening.

In 2007 the City made a more substantive change in course. It adopted the San José Green Vision, a comprehensive plan to reduce the carbon footprint of the City by more than half in 15 years. The "Green Mobility" portion of that plan includes the goal of replacing 100 percent of the City's streetlights with zero emission lighting (lights powered exclusively by renewable energy) in fifteen years. Adopting the new policy would enable to significantly reduce the energy consumption of its lights, an important step towards realizing the City's *Green Vision* goal.

ANALYSIS

To help realize this goal and to drive technology forward, the new policy is performance- rather than product-based. It stipulates performance characteristics new streetlights must meet (programmable, energy-efficient, long lasting, constructed with low or minimal hazardous materials). It also establishes a 18 month transition period; provides for dimming of streetlights within the framework of a Master Lighting Plan; provides that staff work with other interested parties to shift the City's streetlights to a metered electrical rate schedule (based on actual usage); and provides that the staff should explore the viability of instituting an energy cap on the consumption of non-renewable energy within the framework of a Master Lighting Plan.

Lighting Curfews

Lighting levels are typically designed for the maximum level of traffic (pedestrian and vehicular) on a given street. But when traffic volumes subside, it may be reasonable to reduce lighting levels. The American Association of State Highway and Transportation Officials (AASHTO) issued a *Roadway Lighting Design Guide* in 2005 that recognized the value of using "modern controls to turn off or dim selected parts of lighting system as permitted by reduced traffic flow, favorable weather conditions, and other local conditions." Actively operating a public lighting system, they noted, can save energy, lower operating costs, reduce sky glow, and improve public safety by maximizing resources.

The new policy contemplates that the City will make use of advanced lighting technology to vary the amount and color of light shining on its streets and sidewalks depending upon the level of activity, time of day, and location of the street. Doing so would help reduce energy costs, extend the life expectancy of the City's lights, and help protect the night sky. AASHTO recommends deploying "lighting curfews" (using modern controls to dim or shut off selected lights) as part of a "Master Lighting Plan" developed and managed by the City that coordinates and standardizes the design, operation and maintenance of public lighting.

Staff proposes to use the transition period to develop, for City Council review and approval, a Master Lighting Plan for the City of San Jose that sets out standards for where and when lighting curfews would be appropriate, seeks input from stakeholders within and outside the City, and outlines a system for monitoring and regularly upgrading that plan. The Master Lighting Plan would address issues on which the Illuminating Engineering Society (IES) design guideline is silent. Implementation of the lighting curfew would ultimately be coordinated through the City's traffic management information center to facilitate coordination with special events and emergencies. The length of the transition period would be subject to the City Council's adoption of the Master Lighting Plan.

Metering Streetlights

To realize the full benefit of a lighting curfew, the City will need to shift from an un-metered PG&E rate schedule (based on estimated usage) to a metered rate that will allow the City to accrue the maximum level of savings from its conservation efforts. Staff will continue to work with PG&E and other appropriate governmental bodies to resolve technological and regulatory issues to institute a cost-effective system to meter the city's streetlights for billing purposes.

As investments are made to replace existing lighting with new energy-efficient lighting and the City realizes savings from reduced energy use, the Administration will determine if reinvesting those savings into additional energy saving projects would be warranted.

Energy Cap

To meet its budgetary and environmental goals, the City will need to significantly reduce the electrical consumption of its existing lights as well as prevent new lights from increasing the City's energy demand. To accomplish this, staff recommends that as part of the development of a Master Lighting Plan that staff explore the viability of instituting a cap on the amount of electrical energy consumed by the City's streetlights as of July 1, 2010 (subject to the City Council's adoption of the Master Lighting Plan). New lights installed by a private developer or the City after that date must conform to the cap as specified in the Master Lighting Plan. Any electricity consumed by those lights would need to be offset. It is anticipated that the offset would be accomplished by the any of the following means, which will be explored during the development of the Master Lighting Plan:

- The developer or City department/agency can replace existing street or pedestrian lights surrounding the project area with more energy efficient lights. The energy reduction achieved by converting these lights should offset the energy required by the new street lights installed as part of the development; or
- The developer or City department/agency could pay an in lieu fee that would allow the City to replace less efficient lights elsewhere in the city or build a renewable energy facility to offset the power consumed by the new lights, or
- The developer or City department/agency could install solar- (or other renewable energy-) powered pedestrian and/or streetlights that generate sufficient power to offset their electrical use and meet the City's new lighting specifications.
- In the case of infill development where only existing lights are being replaced, the only requirement would be to replace them with lights consistent with the new policy and the Master Lighting Plan. In the development of the Master Lighting Plan, staff will also address the feasibility of granting offset credits to developers for lights converted as part of their development. That credit could be applied to a future development that triggered the offset requirement.

During the transition period, staff will prepare an Implementation Plan as part of the Master Lighting Plan that spells out:

- How the developer/department should calculate the amount of energy they would need to offset and how to evaluate their offset options.
- How to purchase the new streetlights that meet the policy's goals. Initially, it is anticipated that the Department of Transportation will purchase and stock advanced street and pedestrian lights for resale to developers and City departments to ensure quality and uniformity until the technology is standardized. It may be as long as six months after the new policy is approved before the Department will have sufficient stock of the new

lighting fixtures to resell them to interested developers. Staff will ultimately establish approved minimum specifications for the new lighting technologies. After that point, developers will be able to propose other products that meet or exceed the City's minimum standards. The Department of Transportation will work with the Purchasing Division so that the standardization of the specifications is consistent with the requirements of the City's Municipal Code.

- o Staff will investigate the possibility of the Green Building Council and Build It Green granting developers Green Building credits for installing energy efficient lights in the vicinity of their property or elsewhere in the City through the in lieu fee.

EVALUATION AND FOLLOW-UP

Staff recommends that the Committee recommend to Council that it adopt the proposed policy to replace the current policy (4-2).

PUBLIC OUTREACH/INTEREST

As indicated in the background section, staff sought input from a variety of key stakeholders, including members of the development community, Lick Observatory, and lighting companies for consideration.

The reaction of the development community to the new lighting policy was mixed. Developers expressed support for the proposal that the City purchase and resell the streetlights to developers, which would reduce their costs; the prospect of switching to whiter-colored streetlights, the possibility of earning LEED and Build it Green credits for installing more energy efficient lights, and the prospect that the City's revision of its standard specifications might reduce their costs to purchase streetlight poles.

At the same time several developers expressed strong opposition to the idea that developers that install new streetlights would need to offset the energy required to power those lights. This requirement would only be triggered when new streetlights are installed, not when lights are replaced such as in infill developments.

- Criterion 1:** Requires Council action on the use of public funds equal to \$1 million or greater. **(Required: Website Posting)**
- Criterion 2:** Adoption of a new or revised policy that may have implications for public health, safety, quality of life, or financial/economic vitality of the City. **(Required: E-mail and Website Posting)**
- Criterion 3:** Consideration of proposed changes to service delivery, programs, staffing that may have impacts to community services and have been identified by staff, Council or a Community group that requires special outreach. **(Required: E-mail, Website Posting, Community Meetings, Notice in appropriate newspapers)**

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COORDINATION

Staff consulted with Public Works, Planning, Building and Code Enforcement, City Attorney's Office, Redevelopment Agency and the Community and Economic Development CSA in drafting the new streetlighting policy and this memorandum.

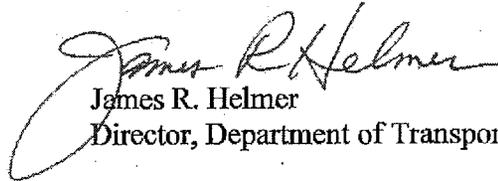
FISCAL/POLICY ALIGNMENT

The proposed policy is consistent with the City of San Jose's Structural Deficit Reduction efforts and San Jose's Green Vision and General Plan policies regarding sustainability. The policy would also reduce greenhouse gas emissions in California, consistent with the goals of AB 32, The California Global Warming Act of 2006.

CEQA

The adoption of the proposed policy is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) per Section 15308 of the CEQA guidelines.

CEQA: Exempt, File No. PP08-222


James R. Helmer
Director, Department of Transportation

For questions please contact Laura Stuchinsky, Sustainability Officer, at 408/975-3226.

ATTACHMENT: proposed new Streetlight Policy Number 4-2

City of San José, California

COUNCIL POLICY

TITLE Public Streetlights	PAGE 1 of 7	POLICY NUMBER 4-2
EFFECTIVE DATE Council Action- February 1980	REVISED DATE Council Action- June 27, 2006, Resolution No. 73313	

APPROVED BY COUNCIL ACTION

PURPOSE

The purpose of this policy is to help the City of San Jose ("City") advance several of its *Green Vision* goals, in particular the goal to replace 100 percent of the City's streetlights with smart, zero emission streetlights (lights powered exclusively by renewable energy) by 2022.

This policy, which replaces the existing Policy Number 4-2, accomplishes this by converting the City's streetlights from sodium-vapor and metal halide lights to more energy-efficient, longer-lasting, and programmable lights. These new lights will reduce the City's energy consumption and maintenance costs, improve the quality of light on the City's streets and sidewalks, and will be constructed in a manner that minimizes or eliminates hazardous waste. The policy also strives to meet the astronomical research needs of the University of California Lick Observatory on Mt. Hamilton.

BACKGROUND

In February 1980, in an effort to reduce the City's energy consumption and related expenses, the City Council adopted Policy Number 4-2. That policy converted San José's then-mercury vapor and incandescent streetlights to sodium vapor lights. Since that time the City has principally employed sodium-based lamps to light its streets and sidewalks.

There are two types of sodium vapor lighting: low- and high-pressure. Initially, the City converted all its residential roadways and major arterials to low-pressure sodium. Minor arterials, except those within nine miles of Lick Observatory, and signalized intersections were converted to high-pressure sodium.

Low-pressure sodium (LPS) lights are more energy efficient than high-pressure sodium lights (HPS), but they cast an orange-yellow light with poor color rendition. It was initially thought that the orange-yellow light might create confusion with the yellow clearance phase of traffic signals. Research later disproved that supposition and in January 1982 the Council modified the City's policy to expand the use of LPS throughout the City. The exception was in the downtown core.

Revitalization of downtown San Jose has been a long-term priority of the City. Excellent lighting quality, and the pedestrian activity it supports, is essential to realizing that vision and capitalizing on investments made in the downtown. As a result, the City Council modified Policy Number 4-2 to specify that HPS be used exclusively in the core.

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Color rendition and brightness are better with HPS than LPS. Those qualities made HPS more attractive to the City's business community. However, Lick Observatory preferred LPS as it could more easily filter out the narrow range of wavelengths LPS casts into the sky. This is why the Council originally prohibited HPS within a nine-mile radius around the observatory. As the City's downtown grew and the Arena was built the demand for more HPS lights increased. The City's revisions of Policy Number 4-2 over the next two decades sought to balance the competing needs of Lick Observatory and the business and neighborhood communities.

In September 2003, the Council authorized the expanded use of HPS streetlights from the core to the Greater Downtown area. Metal halide lights, another light source with excellent color rendition, were also approved for pedestrian lighting in the Greater Downtown. The revision, which occurred with the adoption of the Downtown Street and Pedestrian Lighting Plan, stipulated that all pedestrian light fixtures include cut-off features that would direct the light downward to protect the night sky from excessive glow.

In June 2006 the Council modified its streetlighting policy in coordination with a General Plan amendment that expanded the areas where HPS were permitted. The revision specified that up to 300 HPS could be installed in designated neighborhood business districts and along General Plan designated Pedestrian Corridors in Strong Neighborhood Initiative Redevelopment Project Areas.

In 2007 the City made a more substantive change in course. It adopted the *San José Green Vision*, a comprehensive plan to reduce the carbon footprint of the City by more than half in 15 years. The "Green Mobility" portion of that plan includes the goal of replacing 100 percent of the City's streetlights with smart, zero emission lighting (lights powered exclusively by renewable energy) in fifteen years.

To help the City achieve this ambitious goal, the new policy is outcome- rather than technology-driven. This shift in focus will allow the City to continually improve its lighting system as the technology continues to advance. The policy outlines performance qualities new streetlights should meet: energy efficient, long-lasting, dimmable, programmable, and constructed with minimal hazardous materials. It also establishes an eighteen month transition period; provides for dimming of street and pedestrian lights within the framework of a Master Lighting Plan; provides that staff work with other interested parties to shift the City's streetlights to a metered electrical rate schedule (based on actual usage); and provides that the staff should explore the viability of instituting an energy cap on the consumption of electrical energy within the framework of a Master Lighting Plan.

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GUIDING PRINCIPLES

It is the policy of the City of San José that all new or replaced streetlights on San José's public roadways should help the City achieve its *Green Vision* goals. This policy touches on four of the City's ten Green Vision goals. Those state that by 2022 the City will:

- **Goal # Two: Reduce per capita energy use by 50 percent.**
- **Goal # Three: Obtain 100 percent of the City's electrical power from clean, renewable resources.**
- **Goal # Five: Divert 100 percent of the waste from our landfill.**
- **Goal # Nine: Replace 100 percent of our streetlights with smart, zero emission lighting [powered exclusively with renewable energy].**

POLICY

This policy seeks to achieve San José's *Green Vision* goals, create a pleasing and attractive environment for nighttime activities, and protect the night sky by focusing on outcomes rather than means. It specifies performance characteristics new streetlights must meet: programmable, energy-efficient, long-lasting, constructed with low or minimal hazardous materials. It also stipulates strategies the City should implement that will allow the City to continually improve its lighting system as technology advances. As described below the policy includes an eighteen month transition period; provides for dimming of street and pedestrian lights within the framework of a Master Lighting Plan; provides that staff work with other interested parties to shift the City's streetlights to a metered electrical rate schedule (based on actual usage); and provides that the staff should explore the viability of instituting an energy cap on the consumption of electrical energy within the framework of a Master Lighting Plan.

The strategies and goals of the policy are further described below.

1. Implementation strategies:

Transition Period

During fiscal years 2008-09 and 2009-2010 the City will permit the installation of LPS, HPS and Metal Halide (MH) streetlights and pedestrian walkway lights ("Streetlights") as previously stipulated in Council Policy 4-2 and as set forth in Public Works' specifications for Streetlights in private developments. It is anticipated that during the transition period from adoption of this policy through June 30, 2010, staff will prepare for City Council review and approval a Master Lighting Plan that will address implementation of this policy, including the development of new specifications for Streetlights in private developments. In the event that the Master Lighting Plan is not approved prior to July 1, 2010, the transition period will be automatically extended. References in this policy to the transition period will mean the transition period as extended.

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However, where feasible the City should, and private developers are encouraged, to install Streetlights that align to the goals of this policy during the transition period. During the transition period, developers who desire to install Streetlights that meet the technical characteristics specified in section 2, below, will need to purchase such Streetlights from the City; provided that the City has the Streetlights available.

Beginning July 1, 2010, all new and replaced City Streetlights will meet the criteria outlined under section 2, Technical Characteristics; provided that the Master Lighting Plan is in place.

Lighting Curfews

This policy provides for the City to institute "lighting curfews" – to make use of advanced monitoring and control systems to vary the amount and color of light shining on its streets and sidewalks depending upon the level of activity, time of day, and location of the street. The standards for the lighting curfews will be addressed by a "Master Lighting Plan. Staff in developing the Master Lighting Plan should seek input from stakeholders within and outside the City, and outline a system for monitoring and regularly upgrading the plan.

Metering

New and replaced Streetlights should have the capacity to be metered rather than billed on an un-metered rate. This will allow the City to pay for actual rather than estimated energy usage, rewarding its conservation efforts. Staff should work with PG&E and other appropriate governmental bodies to institute a cost-effective system to meter individual lights and ultimately the entire public streetlight system for billing purposes.

Energy Cap

To meet its budgetary and environmental goals the City will need to significantly reduce the energy consumption of its existing lights as well as prevent consumption from increasing with the installation of new Streetlights. To accomplish this, staff recommends it explore the viability of instituting a cap as of July 1, 2010 on the amount of electrical energy consumed by the City's streetlights. The potential energy cap will be addressed in the Master Lighting Plan. Execution of the cap is subject to the City Council's adoption of the Master Lighting Plan.

The purpose of the energy cap to be explored by staff is that new public Streetlights installed by a private developer or the City after that date must conform to the energy cap as specified in the Master Lighting Plan. Any increase in the City's electrical consumption precipitated by the installation of new lights installed by a private developer or the City lights after that date would need to be offset. It is anticipated that the offset would be accomplished by the means outlined below. An implementation plan, included in the Master Lighting Plan, should spell out the mechanism for calculating and executing

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viable options, which may include those listed below. The feasibility of these options will be explored during the development of the Master Lighting Plan :

- The developer or City department/agency can replace existing street or pedestrian lights surrounding the project area with more energy efficient lights. The energy reduction achieved by converting these lights should offset the consumption of the new Streetlights installed as part of the development; or
- The developer or City department/agency could pay an in lieu fee that would allow the City to replace less efficient Streetlights elsewhere in the city or build a renewable energy facility to offset the power consumed by the new Streetlights, or
- The developer or City department/agency could install solar- (or other renewable energy-) powered pedestrian and/or streetlights that generate sufficient power to offset their electrical use and meet the City's new lighting specifications.
- In the case of infill development where only existing lights are being replaced, the only requirement would be to replace them with lights consistent with this policy and the Master Lighting Plan.

2. Technical characteristics:

Functionality

To maximize energy efficiency and minimize operational costs, new and replacement streetlights should be remotely controlled and monitored. The program should include sunrise/sunset and lunar cycle data for the City and should offer customized capability to turn the light on, off, dim, flash, respond to motion, or potentially change the color of the light. The lights should not be activated solely by photo cells (light sensors).

Programming could be accomplished manually prior to installation of the light, but preferably remotely through a low cost and effective means of communication. Remote programming would increase the City's ability to control its lights, including, for example, flashing the light as an emergency beacon. All new lights should have metering and monitoring devices built in or integrated into the unit and have the capacity to report electrical consumption and malfunctions to the City and/or utility company.

Energy Efficiency

Staff should select and adhere to appropriate governmental energy efficiency certification standards in selecting new and replacement lights. That requirement along with others such as interoperability of the system components should be addressed by the Master Lighting Plan and incorporated into the specifications developed for these new lighting systems.

Dark Skies

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New and replacement streetlights should protect the night sky by offering the ability to change the color of the light from full spectrum (appearing white or near white) in the early evening to a monochromatic light in the later hours of the night and early morning. At a minimum, full spectrum lights should be able to be dimmed by at least 50 percent in late night hours.

All lighting should be designed to direct the light downward and outward with minimal light trespassing upward.

Hazardous Waste

New street and pedestrian lights should be constructed with materials that minimize, if not eliminate, hazardous waste.

DEFINITION OF TERMS:

Zero Emission Lights

Lights powered exclusively by renewable energy. The renewable energy could be supplied by PG&E, a renewable energy facility owned by the City, or renewable energy device attached to the streetlight, such as solar panels, or a combination of the above. The renewable energy could be supplied directly to the light, or through the utility through credits secured by providing PG&E with renewable energy during peak hours.

Monochromatic Light

Light consisting of one wavelength or a narrow range of wavelengths

High Pressure Sodium (HPS)

Both low- and high-pressure sodium lamps utilize sodium and a small amount of neon and argon gas. High-pressure lamps also contain mercury. Both sodium lamps must be disposed of as a hazardous waste. HPS lights typically last about 18,000 hours (approximately four years, nighttime use only).

Low Pressure Sodium (LPS)

LPS lamps have been considered one of the most energy efficient electrically powered light sources. But the colors of objects cannot easily be distinguished in this light. The lamps must be disposed as a hazardous waste. LPS lamps do not decline in lumen (light) output with age. However, their energy usage increases slightly (about 10 percent) towards their end of life, which is rated around 18,000 hours. LPS lamps cannot be dimmed.

Metal Halide (MH)

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The light cast by metal halide appears white. The life expectancy of MH luminaires expectancy is approximately 15,000–20,000 hours. The lamps contain mercury and must be disposed of as a hazardous waste.

Photocell

A light-sensing device used to turn lamps on and off in response to detected light levels.

Lighting Curfew

Using modern controls to dim or shut off selected lights at particular times.

Pedestrian Lights

Pedestrian-scale, architecturally-pleasing light fixtures designed primarily to illuminate sidewalks and public places. These lights are typically mounted a few feet from the curb and may be oriented towards the sidewalk.

Downtown Core

The traditional downtown bounded by Julian Street to the north, highway 87 to the west, highway 280 to the south, and 4th Street to the east.

Greater Downtown

The boundary of the Greater Downtown include the areas around Diridon Station, north to Taylor Street, east to Seventh and south to Interstate 280, excluding San José State University.