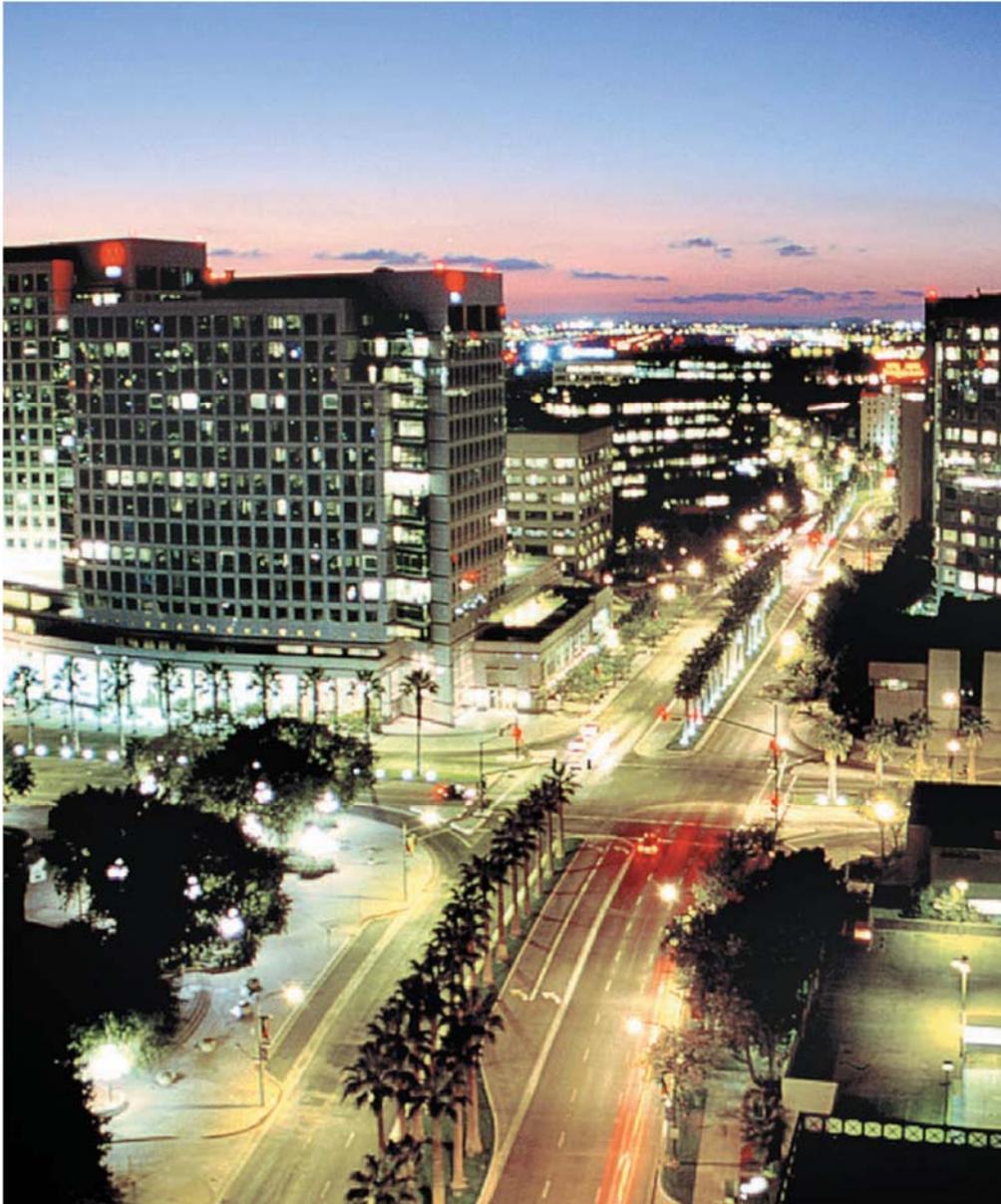




City of San Jose
Department of Transportation
City Hall Tower 8th Floor
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San Jose, CA 95113



DOWNTOWN STREETLIGHT GUIDE
AMENDMENT #1 TO THE CITY OF SAN JOSÉ PUBLIC STREETLIGHT DESIGN GUIDE

January 2017

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INTRODUCTION

This Downtown Streetlight Guide (the Downtown Guide) is Amendment No. 1 of the Public Streetlight Design Guide.

On September 16, 2003, the Joint San José Redevelopment Agency (SJRA) Board and City Council adopted Resolution 71754 to approve San José Downtown Street and Pedestrian Lighting Master Plan¹ (“the 2003 Downtown Master Plan”). On June 6, 2016, the San José City Council adopted Resolution 77764 approving The Public Streetlight Design Guide which stipulated an update to the original 2003 Downtown Master Plan. This Amendment updates the 2003 Downtown Master Plan established by the SJRA, and changes the title from “Downtown Street and Pedestrian Lighting Master Plan” to “Downtown Streetlight Guide” to indicate its status as an amendment to and a component of the Public Streetlight Design Guide. This amendment provides updates to keep the Downtown Streetlight Guide (“Downtown Guide”) current with design practice, and recommends the use of LED light sources for street and pedestrian lighting in the Downtown and Downtown Transit Employment Center Planned Growth Areas (DT & DTTEC) while keeping the enhancement concepts established in the 2003 Downtown Master Plan.

The 2003 Downtown Master Plan established guidelines that address future development, including incremental changes, to the downtown lighting in a consistent and cohesive manner. With the continuing growth and revitalization of downtown, lighting plays a critical role in the perception of and attraction to the downtown at night. This Downtown Guide follows the spirit of the 2003 Downtown Master Plan and maintains the same lighting aesthetic concepts.

The Downtown Guide addresses the public right of way through the illumination of pedestrian

paths and streets. Lighting creates appealing spaces, providing exciting and attractive places where people can feel safe and secure at night. The Downtown Guide encompasses design principles, the type and location of the light fixtures, light levels, and considerations for the Lick Observatory. It charts a path for future lighting development based on research, history, technical and aesthetic requirements and the principle of a humanistic approach to the lighted environment. With the inclusion of pedestrian light fixtures, it supports the vision of a pedestrian-friendly downtown, adding vitality to nighttime retail, dining and entertainment activities.

This Downtown Guide briefly outlines existing lighting conditions, then provides detailed recommendations to be implemented in future years as development occurs and as public funding for lighting improvements becomes available.

This Downtown Guide provides design guidelines for street and pedestrian light fixtures and locations in the public right of way. The streets shown on the maps within the Downtown Guide illustrate both existing street pattern and potential street improvements.

This Downtown Guide recommends that all light fixtures use LED light sources in order to reduce energy costs, and improve the life of the light fixtures while providing good color rendering.

Note 1: The San José Downtown Street and Pedestrian Lighting Master Plan was developed in coordination with the San Jose Downtown Streetscape Master Plan and the Downtown San Jose Signage Plan. The original versions of these documents may be accessed at:

<http://www.sjredevelopment.org/publications.htm>

EXISTING CONDITIONS

OVERVIEW

DT & DTTEC have a streetlight system that has evolved over the years. Many streets have adequate levels of lighting; others may have light levels lower than the goals established in the 2003 Master Plan because no improvement projects have been done on those streets.

The existing City standard streetlight is the cobra head fixture on an eight-sided octaflute pole. The streetlight fixture light sources included in the 2003 Downtown Master Plan are high pressure sodium (amber color), low pressure sodium (orange color), and metal halide (white color). Since the adoption of LED

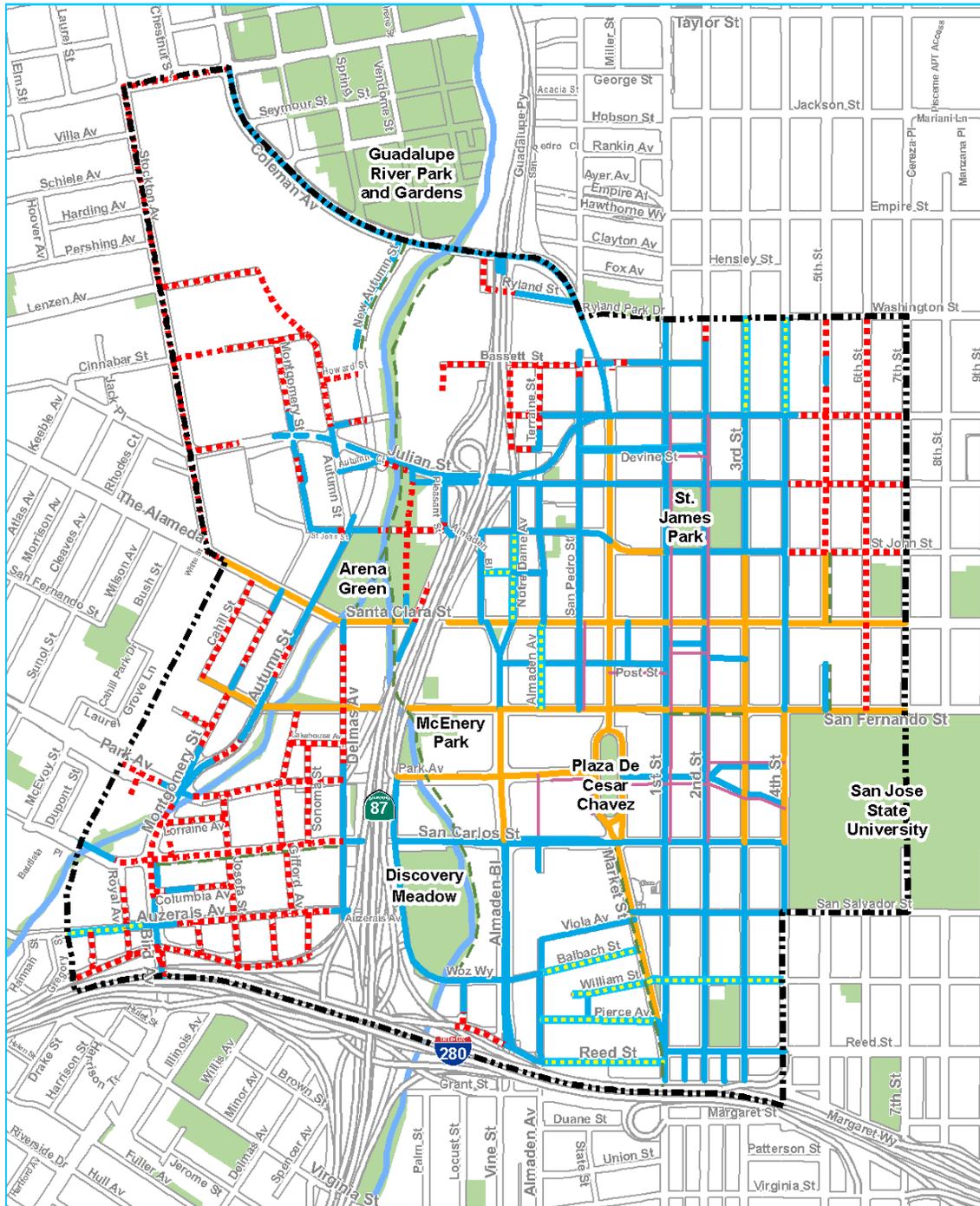
technology in 2011, a number of pilots and projects have installed LEDs in the downtown area.

Historic style single-head and double-head pedestrian light fixtures occur on streets and pedestrian areas of historic significance or character: the Transit Mall, parts of Santa Clara Street, San Pedro Street, Post Street, Paseos and in certain downtown parks. In some areas historic pedestrian fixtures serve both as street and pedestrian lighting, such as in the Market-Almaden neighborhood. The existing street and pedestrian light fixture styles and light source types are shown on Map 1: Existing Street and Pedestrian Light Fixtures.

MAP 1: EXISTING STREET AND PEDESTRIAN LIGHT FIXTURES

Legend

- Street Light Fixture: High Pressure Sodium
- - - Street Light Fixture: Low Pressure Sodium
- Street Light Fixture: LED Pilot, Smartpole Mitigation and BRT Projects
- · - · - Pedestrian Light Fixture: High Pressure Sodium
- · - · - Pedestrian Light Fixture: Metal Halide
- Twin Pedestrian Light Fixture: High Pressure Sodium
- 2003 Lighting Study Boundary



RECOMMENDATIONS

OVERVIEW

The purpose of the lighting recommendations in this guide is to serve as guidelines to develop lighting requirements and establish a single source lighting design document that covers all of the DT & DTTEC. These recommendations update the Downtown Guide to current industry practice, follow a common-sense humanistic approach and take into consideration the latest technology. Recommendations are made in the following areas:

- Design Principles
- Street and Pedestrian Light Fixture Types
- Light Level Design Goals
- Implementation Maps of Fixture Types

USE OF THIS GUIDE

Lighting improvements will occur over time. These guidelines will be used for lighting improvements under two primary scenarios:

1. Private Development: As new development or development occurs in the DT & DTTEC, lighting improvements in the public right of way are required as a condition of development. Developers will use the Downtown Guide to define what improvements are needed at the sidewalks adjacent to the new development. Staff will use the Plan to review development proposals and issue development permits.
2. Public Projects: Based on the annual budget decisions of the City Council, the Downtown Guide will be used to design and construct publicly funded projects with lighting improvements.

Where possible, effort should be made to minimize the capital costs of lighting

improvements and ongoing maintenance. Existing infrastructure such as light fixtures, pole locations, poles, electrical systems and service panels may be used and reused.

This Downtown Guide, as an amendment to the Public Streetlight Design Guide, should serve as the primary guide document for the DT & DTTEC area. However, certain sections of the Public Streetlight Design Guide still apply as specifically referenced in this document.

LIGHTING DESIGN PRINCIPLES

Proper lighting is essential to the success and comfort of the DT & DTTEC at night. It addresses not only the necessity of visibility, but also focuses attention on areas of activity and determines the color palate of the nighttime DT & DTTEC. Two lighting systems are recommended: street lighting on all streets and pedestrian lighting along the sidewalks of designated corridors or areas. Six core design principles will determine the direction for the evolution of streetscape lighting in the DT & DTTEC. Each principle has a series of considerations that will guide the course of action during street lighting design.

PRINCIPLE 1: CREATE DOWNTOWN IDENTITY AT NIGHT

Visitors, residents and commuters should recognize that they are within the DT & DTTEC by the character of the streetscape and street lighting.

A goal of the Plan is to maintain consistency of light fixture types along the length of a street. This will be achieved by:

- Color of light: LED light sources with Different color temperatures that provide good color rendering will be used in streetlights (moonlight), and pedestrian light (warm white) fixtures in the DT & DTTEC areas.
- Pedestrian light fixture type: The pedestrian light fixture type appropriate to each area will

be used on Urban Structure Streets and Downtown Pedestrian Network Streets with High Pedestrian Volume as shown on Map 2: Downtown Guide Streets. The Civic Plaza area and South First Street areas have distinct pedestrian light fixture types reinforcing the identity of these areas.

- Light pole type: Most streetlight fixtures will be mounted to the distinctive existing eight-sided octaflute pole. Civic Plaza streetlight fixtures and pedestrian light fixtures maintain distinctive pole types appropriate for the particular fixture styles. Pedestrian light pole styles will be consistent with the existing styles on the streets
- Spacing of poles: Poles will be located to achieve the goals as stated Table 1: Light Level Goals. Whenever possible existing streetlight poles and locations will be used. Pedestrian light fixtures will be located between the streetlight poles.
- Vehicular and pedestrian lighting levels: Graduated light level goals have been established for each type of street and pedestrian way as shown in Table 1. Light level goals are highest on the “Urban Structure” and “Downtown Pedestrian Network with High Pedestrian Volume” and decrease as the streets become more residential in character. Map 2 identifies the types of streets and pedestrian ways in the DT & DTTEC; these types are further described in Table 2: Downtown Guide Street and Pedestrian Way Category Descriptions.

PRINCIPLE 2: ENCOURAGE PEDESTRIAN USE OF THE DT & DTTEC

The lighting will contribute to a safe, attractive environment for the pedestrian at night and encourage nighttime use of the DT & DTTEC. To realize this principle, the lighting will:

- Have light levels that are safe and increase visibility.

- Be relatively uniform so there are no perceived inappropriate dark areas.
- Have good color rendering to identify cars, read signs, and clearly identify pedestrians.
- Make destinations appealing by highlighting streetscape elements and gathering places.
- Be architecturally appropriate to the streetscape.
- Minimize discomfort glare.
- Use pedestrian light fixture types as indicated in Table 3: Light Fixture Descriptions, and as appropriate for each street type and area shown on Map 3: Recommended Historic Pedestrian Light Fixtures, and Map 4: Recommended Contemporary Street and Pedestrian Light Fixtures.

PRINCIPLE 3: PRESENT A COHESIVE LIGHTING APPROACH

There will be a consistent, interrelated design approach to the lighting so that the City, its Contractors and its Developers are working toward the same objective. In order to achieve a cohesive approach, the Downtown Guide:

- Identifies areas with historic light fixtures and contemporary pedestrian light fixtures.
- Recommends Light Levels for LED light sources and technological advancement to provide a consistent guideline for the DT & DTTEC.
- Updates general lighting equipment descriptions based on technological advancement.
- Defines criteria for Developers to submit light level calculations in the public right-of-way to demonstrate lighting compliance for required public improvements for all new projects.

PRINCIPLE 4: IDENTIFY SPECIAL AREAS

There are historic neighborhoods and distinct areas that should be respected and emphasized in accordance with the Downtown Streetscape Master Plan established by the San Jose Redevelopment Agency in 2003. Area specific historic or contemporary pedestrian light fixtures will be used as appropriate along Downtown Urban Structure and Downtown Pedestrian Network Streets (both types) to identify these areas. These fixture types are shown on Map 3: Recommended Historic Pedestrian Light Fixtures, and Map 4: Recommended Contemporary Street and Pedestrian Light Fixtures, and street types are shown on Map 2 and described further in Table 2.

PRINCIPLE 5: RESPECT OBSERVATORY

Streetlight Policy 4-2 strives to meet the astronomical research needs of the University of California Lick Observatory on Mt. Hamilton. The lighting design should take into consideration the Observatory by:

- Use of LED streetlights that emit zero uplight.
- Continued use of downward aiming or shielding for pedestrian light fixtures wherever practical.

- Selective use of control and monitoring system, or timers to switch off pedestrian light fixtures at a prescribed time of night.

PRINCIPLE 6: BUILD UPON EXISTING INFRASTRUCTURE

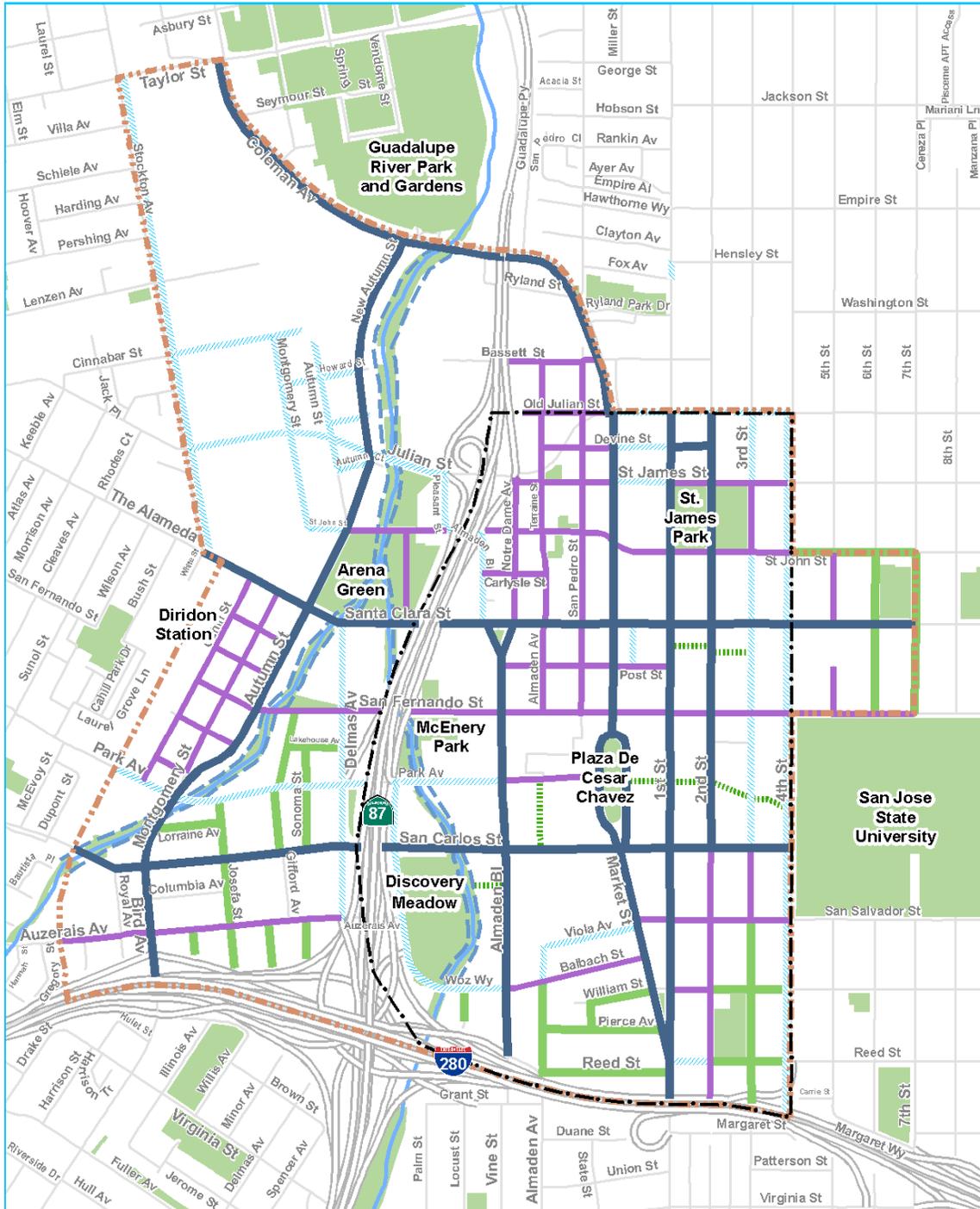
The lighting system should use and build upon the existing infrastructure to minimize future costs and to be efficient. Based on lighting level calculations, the lighting system should whenever possible:

- Use existing light fixture locations.
- Use existing City Standard light fixtures that are compatible with those included in this Downtown Guide.
- Modify existing above grade cabinets according to the above ground cabinet guidelines in the 2003 Downtown Streetscape Master Plan or any revisions thereafter.
- Replace old technology with more advanced new technology.
- Coordinate relocation or reinstallation of existing devices mounted on streetlight poles, to new, existing or relocated streetlight poles where possible.

MAP 2: DOWNTOWN GUIDE STREETS

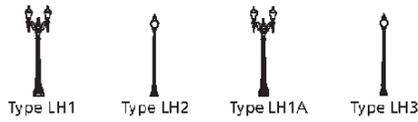
Legend

- Urban Structure Streets
- Downtown Pedestrian Network Streets/High Pedestrian Volume
- Downtown Pedestrian Network Streets/Moderate Pedestrian Volume
- Downtown Residential Streets
- Paseos
- Guadalupe River Pedestrian Paths
- 1989 Streetscape Study Boundary
- Downtown and Downtown Transit Employment Center (DT & DTTEC)



MAP 3: RECOMMENDED HISTORIC PEDESTRIAN LIGHT FIXTURES

Legend



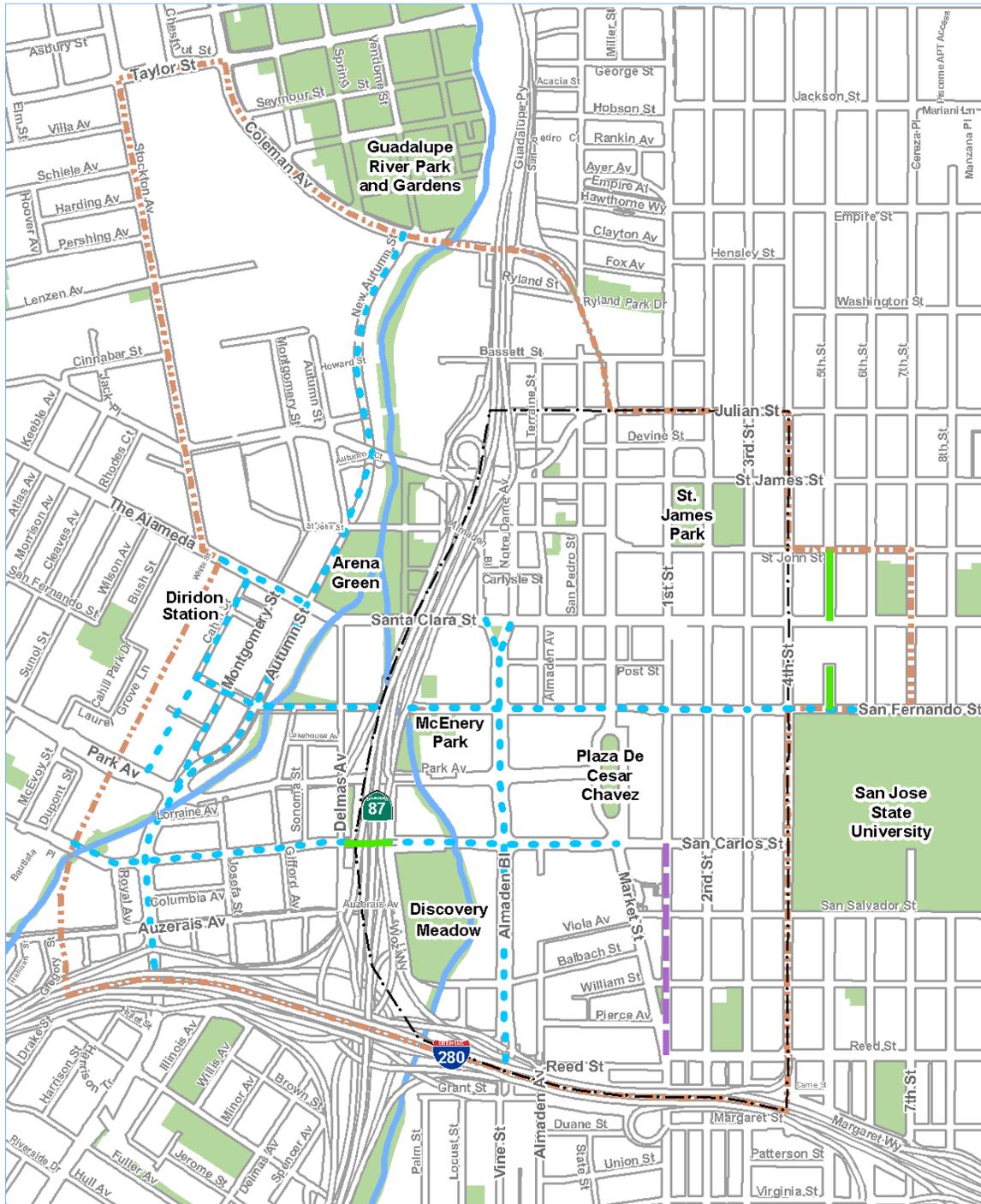
- Twin Pedestrian Light Fixture: Type LH1
- Twin Pedestrian Light Fixture: Type LH1A
- Pedestrian Light Fixture: Type LH2
- Pedestrian Light Fixture: Type LH3
- 1989 Streetscape Study Boundary
- Downtown and Downtown Transit Employment Center (DT & DTTEC)



MAP 4: RECOMMENDED CONTEMPORARY STREET AND PEDESTRIAN LIGHT FIXTURES

Legend

-  Type LP1
-  Type LP2
-  Type LP3
-  Type LS3
-  Pedestrian Light Fixture: Type LP1
-  Pedestrian Light Fixture: Type LP2
-  Pedestrian Light Fixture: Type LP3 and Streetlight Fixture: Type LS3
-  1989 Streetscape Study Boundary
-  Downtown and Downtown Transit Employment Center (DT & DTTEC)



GUIDELINES FOR LIGHT LEVELS

The purpose of these Guidelines for Light Levels is to define and update the street and pedestrian lighting goals currently in use in the DT & DTTEC.

The Guidelines:

- Define lighting uniformity ratios.
- Define what criteria take precedence where.

Additionally this revision:

- Updates street, intersection and pedestrian way lighting goals.
- Updates minimum maintained light levels.
- Updates lighting goals for Paseos, and Holiday Lighting.
- Adds goals for mid-block crosswalks.

TABLE 1: LIGHT LEVEL GOALS

Streetscape Master Plan Street and Pedestrian Category	Horizontal Light Level at Grade, Minimum Average Maintained	Intersection Light Level, Minimum Average Maintained	Uniformity Ratio, Average/ Minimum
STREETS			
Urban Structure	2.7 footcandle	4.1 footcandle	3:1
Downtown Pedestrian Network / High Pedestrian Volume	2.7 footcandle	4.1 footcandle	3:1
Downtown Pedestrian Network / Moderate Pedestrian Volume	1.6 footcandle	2.2 footcandle	4:1
Downtown Residential	1.1 footcandle	1.6 footcandle	6:1
PEDESTRIAN WAY			
Urban Structure	1.8 footcandle	---	4:1
Downtown Pedestrian Network / High Pedestrian Volume	1.8 footcandle	---	4:1
Downtown Pedestrian Network / Moderate Pedestrian Volume	0.9 footcandle	---	4:1
Urban Parks	0.9 footcandle	---	4:1
Downtown Residential	0.4 footcandle	---	6:1
Underpass	3.6 footcandle	---	4:1

- Pedestrian Network Streets are divided into two light level categories: Pedestrian Network Streets / High Pedestrian Volume and Pedestrian Network Streets – Moderate Pedestrian Volume. Pedestrian Network Streets / High Pedestrian Volume are characterized by the same light level as Urban Structure Streets and use of pedestrian light fixtures.

TABLE 2: DOWNTOWN GUIDE STREET AND PEDESTRIAN WAY CATEGORY DESCRIPTIONS

Streetscape Master Plan Street and Pedestrian Category	IESNA Street & Pedestrian Category	Description
STREETS		
Urban Structure	Major	That part of the roadway system that serves as the principal network for through-traffic flow. The rounds connect areas of principal traffic generation at important roadways leaving the city. These routes are often known as “arterials,” “thoroughfares,” or “peripherals”.
Downtown Pedestrian Network -- High Pedestrian Volume	Major	See Urban Structure
Downtown Pedestrian Network -- Moderate Pedestrian Volume	Collector	Roadways servicing traffic between major and local streets. These streets are used mainly for traffic movements within residential, commercial and industrial areas. They do not handle long, through trips. Collector streets may be used for truck or bus movements and give direct service to affecting properties.
Downtown Residential	Local	Residential streets are used primarily for direct access to residential, commercial, industrial, or other abutting property. They make a large percentage of the total Street system, but carry a small portion of vehicular traffic.
PEDESTRIAN WAY		
Urban Structure	High	High night pedestrian activity such as commercial and commercial retail areas, traffic corridors, paseos, museum areas, and library areas in urban environments. The streets are characterized by the use of pedestrian light fixtures.
Downtown Pedestrian Network -- High Pedestrian Volume	High	See Urban Structure
Downtown Pedestrian Network -- Moderate Pedestrian Volume	Medium	Moderate night pedestrian activity such as near community facilities like recreation centers, local retail, and urban parks.
Urban Parks	Medium	Moderate night pedestrian activity such as near community facilities like recreation centers, local retail, and urban parks.
Downtown Residential	Low	Modest night pedestrian activity such as in residential areas.
Underpass	Medium	Moderate night pedestrian activity but with limited access.

LIGHT LEVEL GOALS

Table 1 details the light level goals for lighting in the DT & DTTEC using LED lighting sources. Street and pedestrian way categories listed in Table 1 are defined in Table 2 and shown on Map 2

Minimum average maintained light levels are listed to account for light loss over time. As the light source ages, equipment begins to wear, dirt accumulates, and light levels drop to what is known as maintained light levels. This reduction in light is called a light loss and can be accounted for by including a light loss factor (LLF) in the lighting calculations.

STREETLIGHTING

Streetlight level goals are listed in Table 1 under “Horizontal Light Level, and Uniformity” in the “Street” section of the table.

PEDESTRIAN LIGHTING

Pedestrian light level goals are listed in Table 1 under the “Horizontal Light Level and Uniformity” in the “Pedestrian Way” section of the table.

INTERSECTION LIGHTING

Intersection light level goals are listed in Table 1 under “Intersection Light Level and Uniformity” in the “Street” section of the table. Intersection area definitions are per the Public Streetlight Design Guide, Section 2-6.

MID-BLOCK CROSSWALK LIGHTING

The lighting goal for mid-block crosswalks is the goal for an intersection with high pedestrian classification for type of street in which the cross walk is located.

PASEO LIGHTING

Paseos have the same requirements as pedestrian lighting for a Downtown Pedestrian Network Street – High Pedestrian Volume with regard to light level and uniformity goals. Paseos will be illuminated using City standard

historic light fixtures. Other light fixture types may be considered in new paseo systems that reflect the surrounding area.

HOLIDAY LIGHTING

The City has an existing holiday lighting program. Wiring for holiday lighting should be 120 volt, incorporated in poles, but with separate wiring and metering from street and pedestrian lighting. Such wiring should provide power, high on streetlight poles, to temporary holiday lighting equipment.

CONSIDERATION FOR THE LICK OBSERVATORY

The lighting needs of a major urban center such as Downtown San Jose present challenges for the Lick Observatory. Telescopes require dark environments; cities require illuminated environments. There is a delicate balance between accommodating the requirements of the Observatory and the requirements of the growing DT & DTTEC. The recommendations in the Downtown Guide have acknowledged the City’s steps to control and minimize the effect of electric light in the nighttime environment. The following specific actions have been taken to mitigate nighttime sky glow:

- The recommended contemporary pedestrian fixtures have been selected to mitigate light pollution and minimize up-light in the environment.
- Shielding and reflectors are used in standard historic fixtures to reduce the upward lighting component.
- Street and pedestrian lights will have Backlight-Up-light-Glare (BUG) limits. The BUG limits on streetlights will be similar to the previous cut off type streetlights.
- Timers and networked controls and monitoring equipment can be installed to switch off pedestrian light fixtures at a prescribed time of night when service cabinets

are installed or replaced. Timing will vary depending upon locations and pedestrian night activities.

- Streetlights will have networked controls and monitoring equipment to minimize over lighting, and to provide for future consideration of adaptive lighting schedules.

LIGHTING CALCULATIONS

When submitting street and pedestrian lighting improvement plans to the City for street improvements, light level calculations shall be submitted with the lighting layout to demonstrate compliance with the Downtown Guide Light Level Goals. The light level calculations shall be performed using a recognized industry standard computerized lighting program. The acceptable software for computerized lighting calculations is AGI32 by Lighting Analysts, Inc.

Light level calculations shall be performed or certified by a qualified lighting professional, and shall be provided for each lighting layout or change in fixture spacing along the street, along the pedestrian way and for intersections.

Calculations shall be presented in a point by point calculation grid calculated as follows:

- Streets: points 10' on center over the area of the roadway surface, curb to curb, (excluding median islands over 5' in width).

- Intersections: points 5' on center.
- Sidewalks 10' wide: 2 points, 5' on center, 2.5' from edges. Sidewalks 15' wide: 3 points, 5' on center, 2.5' from edges. Sidewalks with other widths should have approximately one point for every 25 square feet.

Include all City-owned light fixtures that contribute to the results as compared to the goals. Include light fixtures permitted to be in the right of way (or areas within the street).

Pedestrian lights may be aimed toward the sidewalk.

A summary chart confirming compliance with the Guidelines shall be provided with each lighting layout. The summary chart shall list the calculation program used, minimum average maintained light level, uniformity ratio, and light-fixture type for the street, intersection and pedestrian way.

Light level shall be calculated in horizontal footcandles at grade.

Light loss factor (LLF) shall be per the Public Streetlight Design Guide, Section 2.9, with 0.60 for metal halide lamps when calculating light levels in the DT & DTTEC.

LIGHT FIXTURE SCHEDULE

GENERAL REQUIREMENTS

The recommended light fixtures incorporate the Downtown Guide requirements.

NEMA 7 pin control-ready twist-lock photocell receptacles are required for streetlight luminaires, and recommended for pedestrian luminaires, but it is understood that this may not be an option for all pedestrian luminaires. Button-eye photocells may be acceptable for LH3, LP1, LP2, and LP3 type luminaires.

Pedestrian luminaires with Type 2 or 3 photometric distributions are recommended, with the luminaires aimed at the pedestrian way. Pedestrian luminaires with type 5 distributions may be used to significantly contribute to the street lighting goals where necessary.

The light fixtures types listed in Table 3 are recommended for use in the DT & DTTEC as shown on Maps 3 and 4.

Recommended mounting height for streetlights in Table 3 is 31.75 feet.

LIGHT FIXTURE TYPE RECOMMENDATIONS:

Recommended light fixture types general appearance is shown in Table 3: Light Fixture Descriptions, and the Light Fixture Drawings and Photos section.

Light fixtures are classified into three categories: street, pedestrian historic and pedestrian contemporary light fixtures are designated with the following prefixes:

LS (Luminaire Street) = Streetlight fixture

LH (Luminaire Historic) = Pedestrian historic light fixture

LP (Luminaire Pedestrian) = Pedestrian contemporary light fixture

The following criteria establish where each light fixture type will be used within the DT & DTTEC:

- All streetlights will use LED sources with good color rendering and 4,000K (+/-200K) Correlated Color Temperature (CCT). All pedestrian light fixtures will use LED sources with good color rendering and 3,000K (+/-200K) CCT.
- Pedestrian light fixtures appropriate to each area will be used on Downtown Urban Structure and Downtown Pedestrian Network Streets (both types) as shown in Maps 3 and 4.
- Streets, paths and paseos of historic significance or character will have pedestrian historic light fixture types as shown in Map 3.
- Other pedestrian network streets will have pedestrian contemporary light fixture types as shown on Map 4.

Two areas have pedestrian lights that are distinct to their area. The South of First Street (SOFA) will have a pedestrian contemporary light fixture type reflective of the theatre, arts and entertainment district as shown on Map 4 for areas with type LP2 lighting. The Civic Plaza area has a distinct streetlight and pedestrian light fixture type reinforcing the Civic Center/Civic Plaza area as shown on Map 4 for areas with type LS3 and LP3 lighting.

TABLE 3: LIGHT FIXTURE DESCRIPTIONS

Label	Luminaire (see note)	Pole
LS1	LED Streetlight Fixture	City type 10b with C-8 arm, painted black
LS2	LED Transit Mall Streetlight	Special pole maintained by County
LS3	LED Civic Center streetlight fixture (for reference only)	Special contemporary pole (for reference only)
LH1	LED pedestrian historic-style twin light fixture	Fluted pole with heavily styled mast arms and base, painted black
LH1A	LED pedestrian historic-style twin light fixture	Round pole with heavily styled mast arms and base, painted green
LH2	LED pedestrian historic-style fixture	Fluted pole with lightly decorative base painted black
LH3	LED pedestrian historic-style fixture, less ornate	Fluted pole with lightly decorative base, painted black
LP1	LED pedestrian contemporary-style fixture	Straight round pole painted gray
LP2	LED South First pedestrian contemporary-style fixture	Straight round pole painted gray
LP3	LED Civic Center pedestrian contemporary-style fixture (for reference only)	Straight round pole painted gray (for reference only)

Note: Luminaire finish to match pole

The Light Fixture drawings and/ or photos on the following pages contain additional information for the above light fixture types. Photos and information of sample products are used to represent the desired features and aesthetics. Contractors shall refer to project

specification when constructing lights in the DT & DTTEC.

[LIGHT FIXTURE DRAWINGS AND PHOTOS](#)

Light fixture drawings and photos are shown on the following pages.

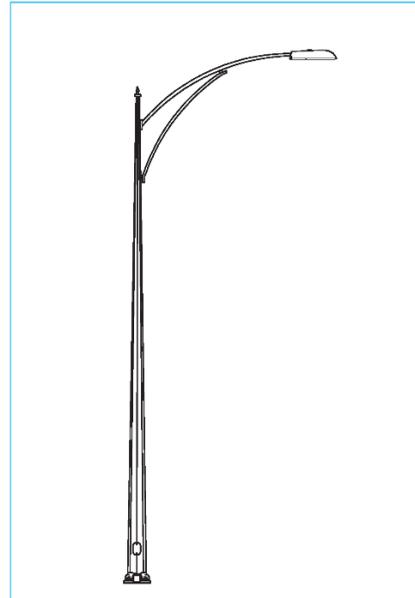
LIGHT FIXTURE TYPES: LS1

Valmont or Union Metal CSJ type 10B with C-8 mast arm model is shown.

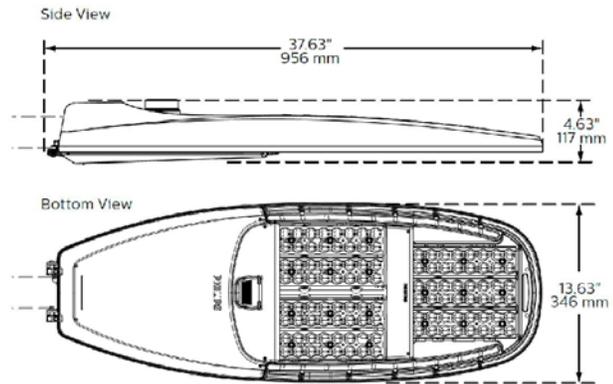
Recommended Luminaire LCS rating for Backlight-Uplight-Glare (BUG):

Urban Structure & Downtown Pedestrian Network / High Pedestrian Volume streets: B4-U0-G4

Downtown Pedestrian Network / Moderate Pedestrian Volume, and Downtown Residential: B3-U0-G3



Philips RoadFocus RFL-41W112LED4K-T-R3M-UNIV-DMG-RCD7-GY3 model is shown below and right.



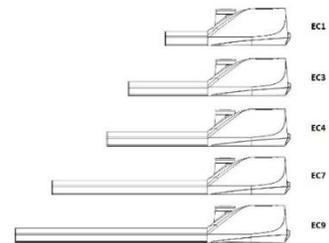
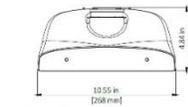
Leotek EC7-18M-MV-NW-3-GY-700-PCR7-CR-WL is shown below and right.

ECobra™ LED Street and Area Light



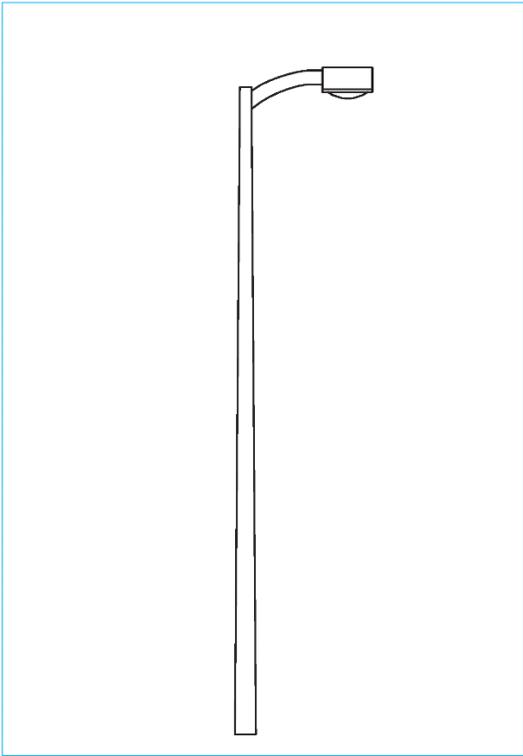
Luminaire Data

	L	Weight	EPA
EC1	16.1 in [409 mm]	10.8 lb [4.9 kg]	0.40 ft ²
EC3	20.8 in [528 mm]	12.7 lb [5.8 kg]	0.45 ft ²
EC4	23.5 in [597 mm]	14.0 lb [6.3 kg]	0.48 ft ²
EC7	30.6 in [777 mm]	19.3 lb [8.8 kg]	0.57 ft ²
EC9	35.4 in [899 mm]	21.3 lb [9.7 kg]	0.63 ft ²



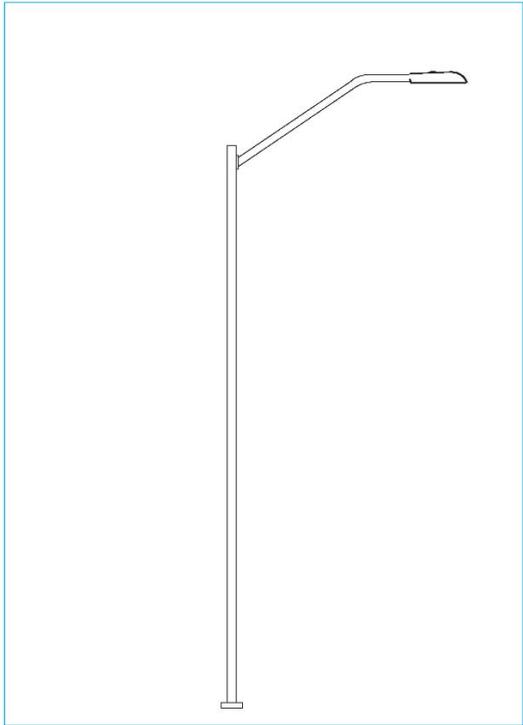
LIGHT FIXTURE TYPE: LS2 (Transit Mall)

Custom Transit Mall Streetlight shown. Luminaire replacement type to be considered by VTA and City



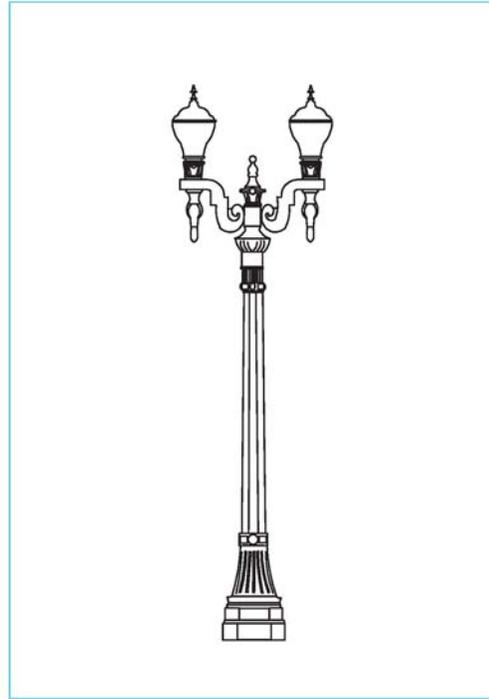
LIGHT FIXTURE TYPE: LS3 (Civic Center)

Custom Civic Center Streetlight shown. See LS1 luminaire types



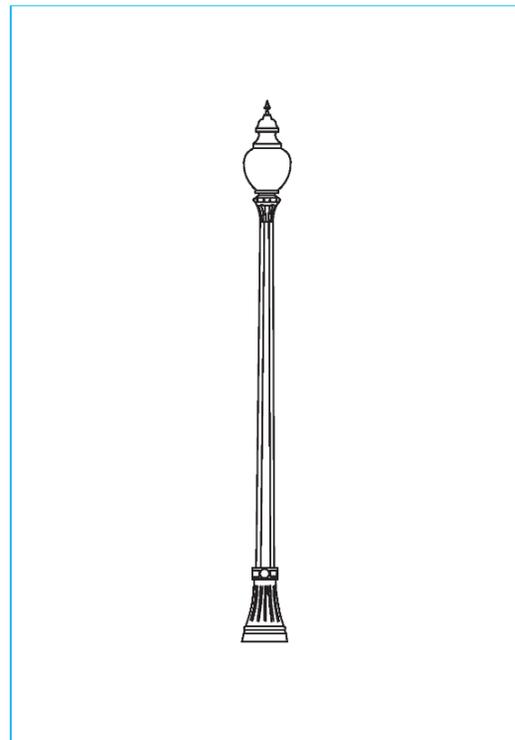
LIGHT FIXTURE TYPES: LH1 AND LH1A

Visco V1-C-C2-F/14(San José-71) model is shown. LH1A is painted green, all others are painted black. LH1A is round, all others are fluted



LIGHT FIXTURE TYPES: LH2 AND LH3

Union Metal P807-20-B79-Y2 one piece pole model is shown. (Refer to LH2 and LH3 for luminaire information)



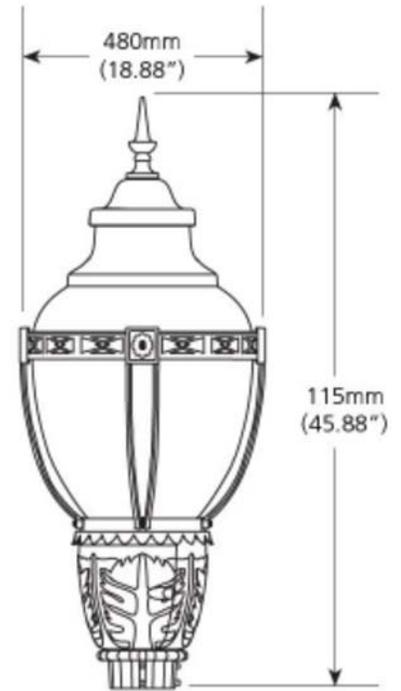
LIGHT FIXTURE TYPES: LH1, LH1A AND LH2 LUMINAIRE

Holophane model AWDE2-PX0-30K-AS-T-BK-X-D-S-BZ-P7-PSC-TB-NL2x2-RBMBZ is shown to the right.

Recommended Luminaire LCS rating for Backlight-Uplight-Glare (BUG):

Urban Structure & Downtown Pedestrian Network / High Pedestrian Volume streets: B2-U3-G2

Downtown Pedestrian Network / Moderate Pedestrian Volume, and Downtown Residential: B2-U3-G2



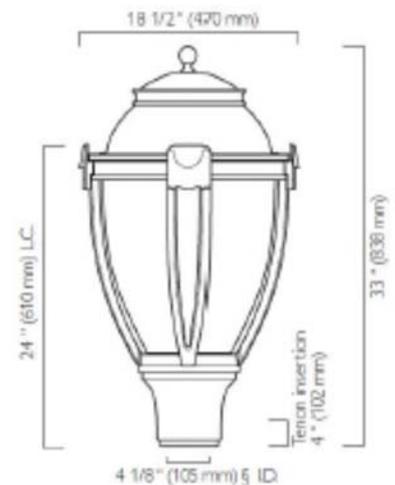
LIGHT FIXTURE TYPE: LH3 LUMINAIRE

Phillips Lumec model L80-SE-XXW-XXLED-3K-PC-CS-LEX-UNIV-DMG-RCD7 SF80-TN2.875C-BKTX-LMS52288A is shown to the right.

Recommended Luminaire LCS rating for Backlight-Uplight-Glare (BUG):

Urban Structure & Downtown Pedestrian Network / High Pedestrian Volume streets: B1-U3-G2

Downtown Pedestrian Network / Moderate Pedestrian Volume, and Downtown Residential: B1-U3-G2



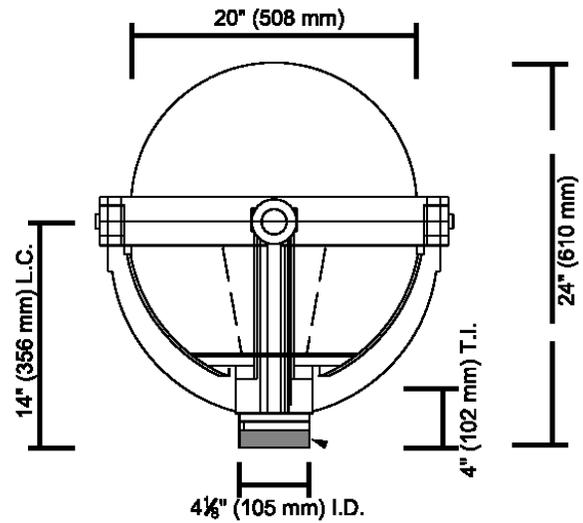
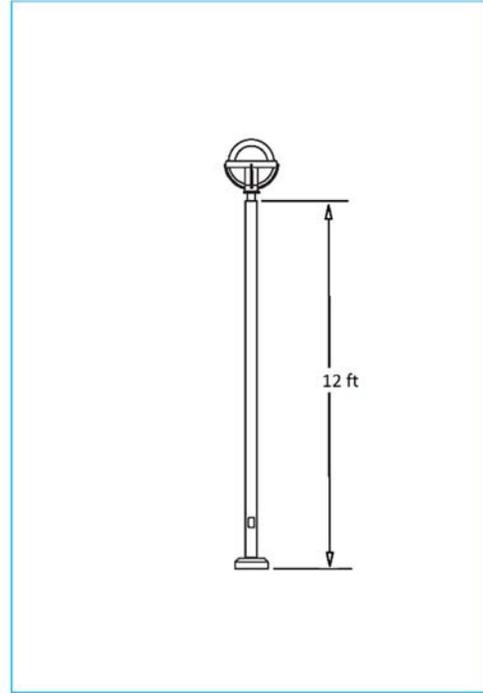
LIGHT FIXTURE TYPE: LP1

Philips Lumec model NW-XXWXXLED3K-R-VOLT-DMG is shown below and to the right.

Recommended Luminaire LCS rating for Backlight-Uplight-Glare (BUG):

Urban Structure & Downtown Pedestrian Network / High Pedestrian Volume streets: B1-U3-G2

Downtown Pedestrian Network / Moderate Pedestrian Volume, and Downtown Residential: B1-U3-G2

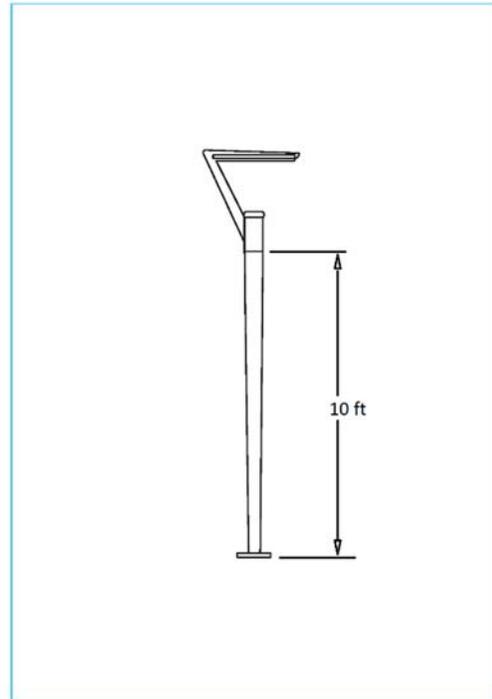


LIGHT FIXTURE TYPE: LP2

HessAmerica model FS720-LED-WW-UNV-P-CC-13IT-CC-SI is shown below and to the right.

Recommended Luminaire LCS rating for Backlight-Uplight-Glare (BUG):

Urban Structure: B2-U3-G0

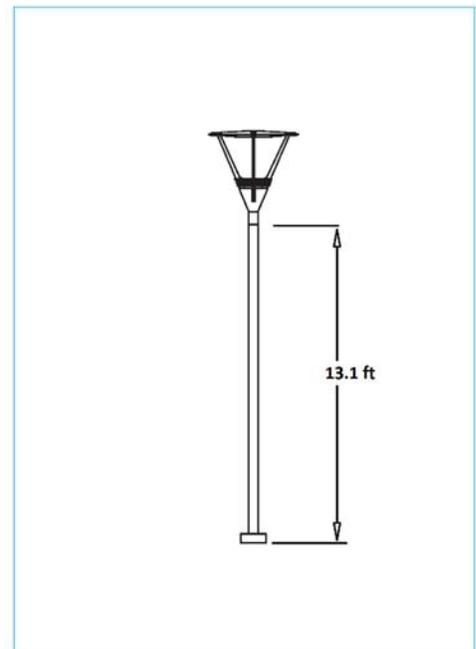
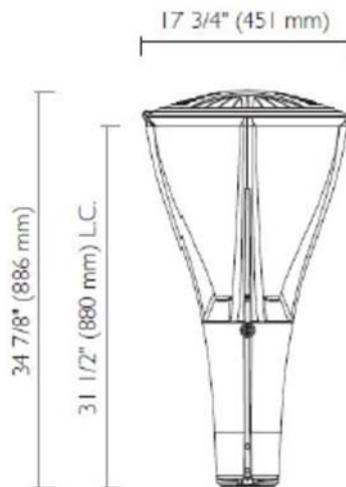


LIGHT FIXTURE TYPE: LP3

Philips Lumec model MPTC-XXW32LED3K-LEX is shown below.

Recommended Luminaire LCS rating for Backlight-Uplight-Glare (BUG):

Downtown Pedestrian Network / High Pedestrian Volume: B1-U1-G1



LIGHTING DEFINITION OF TERMS

Ballast: Device that controls the electric current to the lamp.

Color Rendering: How true colors are rendered under a given light source.

Footcandle: a unit of light, a measurement of illumination describing the intensity of light falling on a surface.

Glare: The sensation produced by brightness within the visual field that is sufficiently greater than the brightness to which the eyes are adapted that causes annoyance, discomfort, or loss in visual performance and visibility. 1

High Intensity Discharge: An electric discharge lamp in which the light is produced by an arc. High Intensity Discharge lamps include mercury, metal halide (MH), high-pressure sodium (HPS) and low pressure sodium (LPS).

High Pressure Sodium (HPS): A high intensity discharge source characterized by amber light.

Illuminating Engineering Society of North America (IESNA): The professional lighting organization recommending lighting practice and application in North America.

Lamp: A generic term for an artificial source of light.

Light Distribution: The pattern of light produced by a light fixture.

Light Fixture: A complete lighting unit consisting of a light source (LED device, lamp or lamps), together with the parts designed to distribute light, to position and protect the light source and to connect the light source to the power supply. Same as a luminaire.

Light Level: Measured in footcandles.

Light Loss Factor: The reduction in light level as the light source ages, equipment begins to wear and dirt accumulates. For the Downtown Guide, light loss factors were derived by factoring together a ballast factor of 1, lamp lumen depreciation by dividing maintained lumens by initial lumens and luminaire dirt depreciation using the luminaire dirt depreciation chart in the 9th Edition of the Lighting Handbook by the Illuminating Engineering Society of North America.

Light Pollution: Sky glow by the brightening of the night sky from superfluous uplight.

Light Source: The element that produces light, commonly referred to as the light bulb or LED device in an electric light fixture.

Louver: A series of baffles used to shield a source from view at certain angles, to absorb or block unwanted light, or to reflect or redirect light. The baffles are usually arranged in a geometric pattern.

Low Pressure Sodium (LPS): A high intensity discharge source characterized by orange light.

Low Voltage: Operating at 24 volts or less or as defined in the National Electrical Code.

Luminaire: Same as a light fixture.

Metal Halide (MH): A high intensity discharge source characterized by white light.

Minimum Average Maintained Footcandles: Maintained light level takes into consideration the degradation of the light fixture and lamp over time and therefore a certain amount of light loss. Minimum light level is the lowest level acceptable. Average takes into account the light level variations over a given area. Minimum average maintained footcandles is the lowest average acceptable footcandle level taking into

consideration light loss factors. In the lighting profession, this terminology clarifies what factors were taken into consideration when determining the light level.

Shielded: An opaque device used on or within the light fixture to mask the light source from view, direct the light toward the task and eliminate glare. Shields include louvers, barn-doors, snoots, hoods, and baffles.

Uniformity: How even the distribution of light is, usually as expressed as a ratio, either the average divided by the minimum, or the maximum divided by the minimum.

Uplight: Light directed above the horizontal plane.

1. Illuminating Engineering Society of North America Roadway Lighting RP-8-00, 1999. The word brightness replaced luminance in the IESNA definition.



Memorandum

TO: JIM ORTBAL
DIRECTOR OF TRANSPORTATION

FROM: Lily Lim-Tsao

**SUBJECT: DOWNTOWN STREETLIGHT
GUIDE**

DATE: June 20, 2017

Approved

Date

6/21/17

RECOMMENDATION

Approve the Downtown Streetlight Guide dated January 2017 as the first amendment to the City of San José Public Streetlight Design Guide to update the lighting source to LED lighting technology.

BACKGROUND

In September 2003, the Joint City Council and San José Redevelopment Agency Board approved the Downtown Street and Pedestrian Lighting Master Plan (2003 Downtown Master Plan). This streetlight design guide supported greater downtown area revitalization with defined lighting levels, source and style. The three types of light sources that were allowed in the downtown area include high-pressure sodium (HPS), low-pressure sodium (LPS), and metal halide (MH) as designated by location.

In December 2008, City Council approved a substantive change to Council Policy 4-2, "Public Streetlights", to advance the City's Green Vision Goal of replacing all city-owned streetlights with smart, zero emission lighting by 2022. As a result, in February 2011, the first version of the Public Streetlight Design Guide was approved by the City Council, adopting the LED technology as the standard for streetlights in San José.

In June 2016, an updated version of the Public Streetlight Design Guide ("Guide") was approved by City Council which provided clarifications for the use of the Guide. At the same time, City Council Resolution 77764 was adopted to authorize the Director of Transportation to approve future updates and amendments to the Public Streetlight Design Guide and the 2003 Downtown Master Plan, consistent with Council Policy 4-2.

ANALYSIS

The Downtown Streetlight Guide provides guidance for street and pedestrian lighting design when improvement projects are being implemented in the Downtown area, but it does not initiate infrastructure improvements by itself. The Guide offers a cohesive lighting approach, and

preserves the special characteristics of the downtown area by maintaining a consistent lighting aesthetic previously established by the 2003 Downtown Master Plan. Upgrading existing lighting source to LED lighting technology will reduce energy costs, improve the life of the light fixtures, and provide good color rendering.

The main components of the Downtown Streetlight Guide include the following:

1. A detailed description and explanation of six principles to be considered when performing lighting designs for Downtown
2. Updated recommendations for LED street and pedestrian light fixtures
3. Updated recommendations for lighting level design goals
4. Updated maps showing the implementation recommendations by street

The approach taken for this update included three aspects: (1) Incorporated experiences and data from prior LED streetlight pilot installations in the Downtown area to update the lighting levels and streetlight fixtures; (2) Researched and identified market available LED pedestrian light fixtures that are functionally and aesthetically similar to the existing pedestrian fixtures; and (3) Updated maps and background information contained in the 2003 Downtown Master Plan document to reflect current conditions.

Key updates incorporated in the Downtown Streetlight Guide include:

- The title of the document is changed from “Downtown Street and Pedestrian Lighting Master Plan” to “Downtown Streetlight Guide” to indicate its status as a component of the citywide Public Streetlight Design Guide;
- The average street lighting level goals are adjusted down by 10% based on the pilot experiences, reflecting benefits of better light quality from LEDs;
- A list of LED street and pedestrian light fixtures are recommended to replace the original non-LED fixtures;
- Smart control requirements are added to streetlights to provide flexibility for lighting operations;
- Downtown area maps in the Master Plan are updated to be consistent with the current General Plan, and to reflect current lighting conditions.

In cases where deviation from the Guide is deemed necessary for a specific project, for example, when (1) pedestrian lighting is desired on a street where no pedestrian lights are recommended in the Guide, or (2) a different fixture style from the recommended is desired for a project site, the Director of Transportation may approve the proposed deviation based on considerations of the impacts on (a) overall character and feel of the public space, and (b) operations and maintenance (O&M) costs.

The updated Downtown Streetlight Guide is provided as an Attachment to this memo.

JIM ORTBAL, Director of Transportation
June 20, 2017
Subject: Downtown Streetlight Guide
Page 3

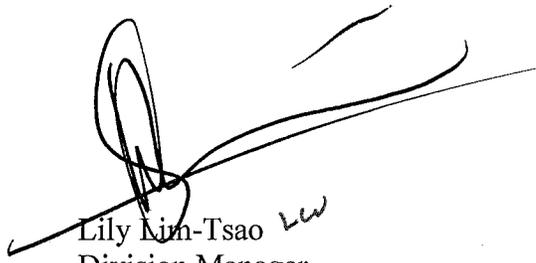
OUTREACH AND COORDINATION

A presentation of the Downtown Streetlight Guide was shared with the Downtown Business Association in October 2016. A presentation was also provided at the Developer's Meeting on December 16, 2016.

The Guide was coordinated with the Office of Economic Development, and Departments of Public Works and Planning. This memo was coordinated with the City Attorney's Office.

CEQA

Exempt, Section 15301 Existing Facilities, File No. PP16-134

A handwritten signature in black ink, consisting of a large, stylized loop followed by a long horizontal stroke that extends to the right.

Lily Lin-Tsao *LLW*
Division Manager
Transportation Safety, Operations and Parking

Attachment