

CITY OF
Carlsbad

BARRIO NEIGHBORHOOD LIGHTING GUIDELINES

FINAL | DECEMBER 2014



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The City of Carlsbad Barrio Neighborhood Lighting Guidelines is maintained by the City of Carlsbad. The guidelines establish uniform policies and procedures for the design of lighting improvements. It is not intended, as nor does it establish, a mandatory standard for lighting designs. The policies established in the lighting guidelines are for the information and use of City of Carlsbad staff. Recommendations within these guidelines are subject to amendment as conditions and experience seem to indicate, in the engineering judgment of the City Engineer or their designee. Special situations may call for variation from the guidelines, to the satisfaction of the City Engineer. These guidelines are not a substitute for engineering knowledge, experience or judgment. It is not intended that any standard of conduct or duty toward the public shall be created or imposed by the publication of these guidelines.

General

1.0 GENERAL

1.1 PURPOSE

Enhancing the pedestrian experience and facilitating neighborhood walkability in the Barrio are priorities for the City of Carlsbad. The installation of lighting along paths and sidewalks contributes to developing these priorities. Appropriate lighting should be considered when designing all pedestrian facilities. Special attention should be given to areas with high pedestrian conflict such as intersections and midblock crossings.

The City of Carlsbad Barrio Neighborhood Lighting Guidelines have been created to aid City Staff in installing Light Emitting Diode (LED) light standards in the Barrio Neighborhood to meet the design goals listed below.

1.2 DESIGN GOALS

The primary objective of these guidelines is to enhance the pedestrian environment through the effective use and installation of efficient lighting systems.

The overall design goal is to provide lighting systems that will:

- a. Create an attractive and inviting pedestrian environment
- b. Make the Barrio neighborhood more livable, walkable, and accessible
- c. Provide a sense of neighborhood continuity
- d. Provide efficient lighting for pedestrian paths and street crossings

1.3 REFERENCES

The following documents are referenced in these guidelines:

City of Carlsbad *Engineering Standards*

NCHRP Report No. 672: *Roundabouts: An Informational Guide – Latest Edition*

FHWA Publication No. FHWA-HRT_08-03 – *Informational Report on Lighting Design for Midblock Crosswalks*

General information in these guidelines derives from existing national, state, and municipal lighting criteria throughout the United States. Photometric calculations were performed in developing these specific guidelines for recommended lighting. For street lighting requirements, refer to Section 10, “Street Lights” of Chapter 3 – Public Street and Traffic Standards in the *City of Carlsbad Engineering Standards*.

Light Standards

2.0 LIGHT STANDARDS

2.1 STREET LIGHT STANDARD

Street light standards shall conform to the standards specified in Section 10, “Street Lights”, of Chapter 3 – Public Street and Traffic Standards in the *City of Carlsbad Engineering Standards*.

2.2 PEDESTRIAN LIGHT STANDARD

Pedestrian lighting is characterized by lower intensity light fixtures on shorter, “pedestrian scale” poles. They are designed to illuminate pedestrian walkways and should not be used to illuminate pedestrian street crossings and intersections.

Pedestrian light standards shall meet the following design criteria:

- 13' Pole with Acorn Fixture
- LED Luminaire
- CCT = Minimum 5,000K
- Type V, Symmetric Light Distribution
- Minimum 3,800 pupil lumen (non-commercial areas)
- Minimum 7,400 pupil lumen (commercial areas)

Recommended Illumination

3.0 RECOMMENDED ILLUMINATION

This section of these guidelines provides recommended lighting and pole placement for various situations.

3.1 UNSIGNALIZED INTERSECTIONS

The nighttime visibility of a pedestrian within an intersection is enhanced by increased contrast between the pedestrian and the surrounding street area. Because intersections are generally well lit, street light standards are traditionally placed beyond the pedestrian crossing from the perspective of the driver to backlight the pedestrians in negative contrast. However, according to FHWA Publication No. FHWA-HRT_08-03 – *Informational Report on Lighting Design for Midblock Crosswalks*, it is difficult or impossible for a lighting system to maintain negative contrast because the increasing vertical illuminance provided by the vehicle low-beam headlamps will result in pedestrians having a higher luminance than the surrounding street area as the vehicle approaches the intersection. Therefore it is generally considered good practice to establish a lighting system that results in positive contrast for drivers to detect pedestrians at a distance that will provide adequate response time.

FHWA Publication No. FHWA-HRT_08-03 – *Informational Report on Lighting Design for Midblock Crosswalks* recommends that the outer sides of the pedestrian crossings be illuminated to a higher level than the interior side of the same crossing. In order to provide for positive contrast of the pedestrian, street light standards should be placed prior to the pedestrian crossing from the perspective of the driver.

3.1 UNSIGNALIZED INTERSECTIONS

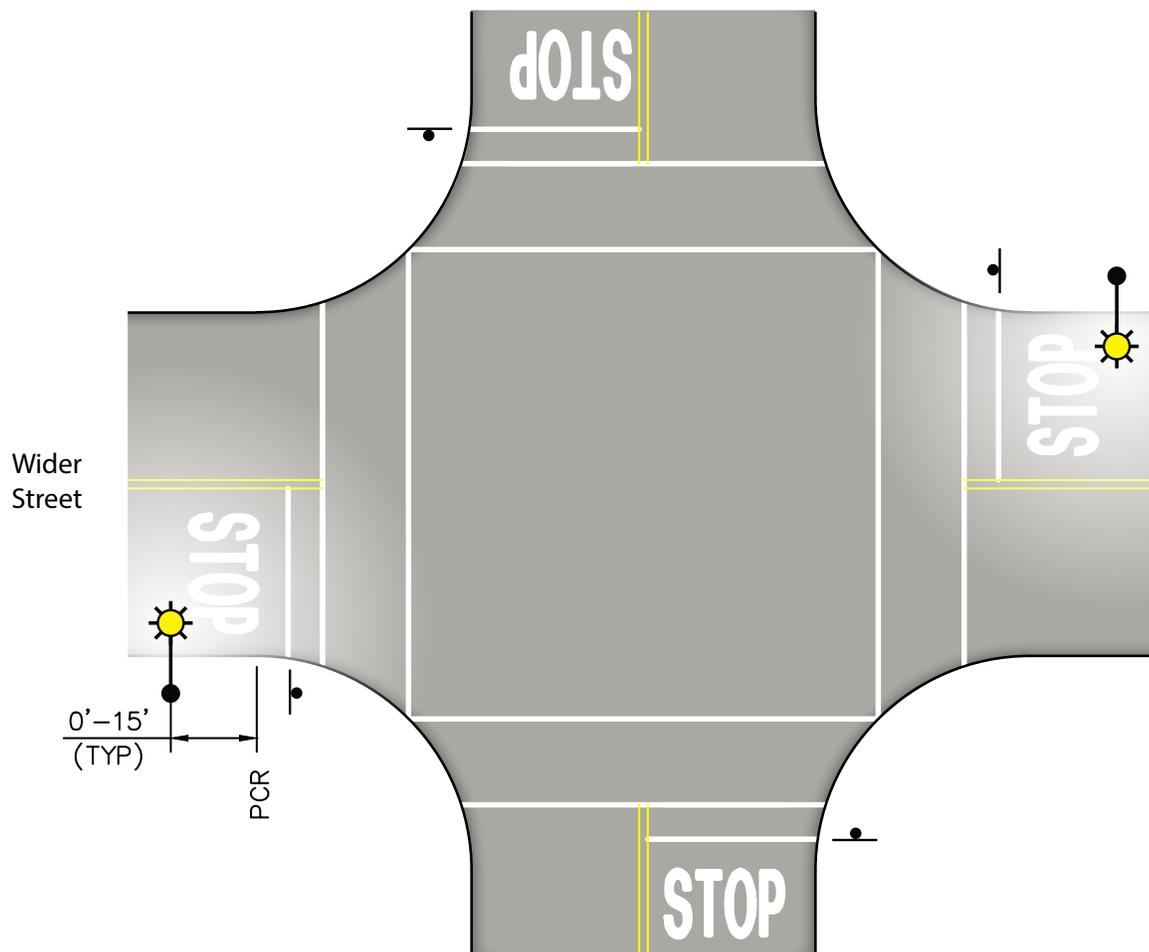
3.1.1 LOCAL/LOCAL INTERSECTIONS

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4-Way and 2-Way Stop Controlled Intersections

Two 5,500 pupil lumen street light standard on the corners of the wider street are recommended. Street light standards should be placed 0' to 15' from the point of curb return on the approach sides of the intersection.

FIGURE



Lighting at Local/Local stop controlled Intersections
(4-way and 2-way)

3.1 UNSIGNALIZED INTERSECTIONS

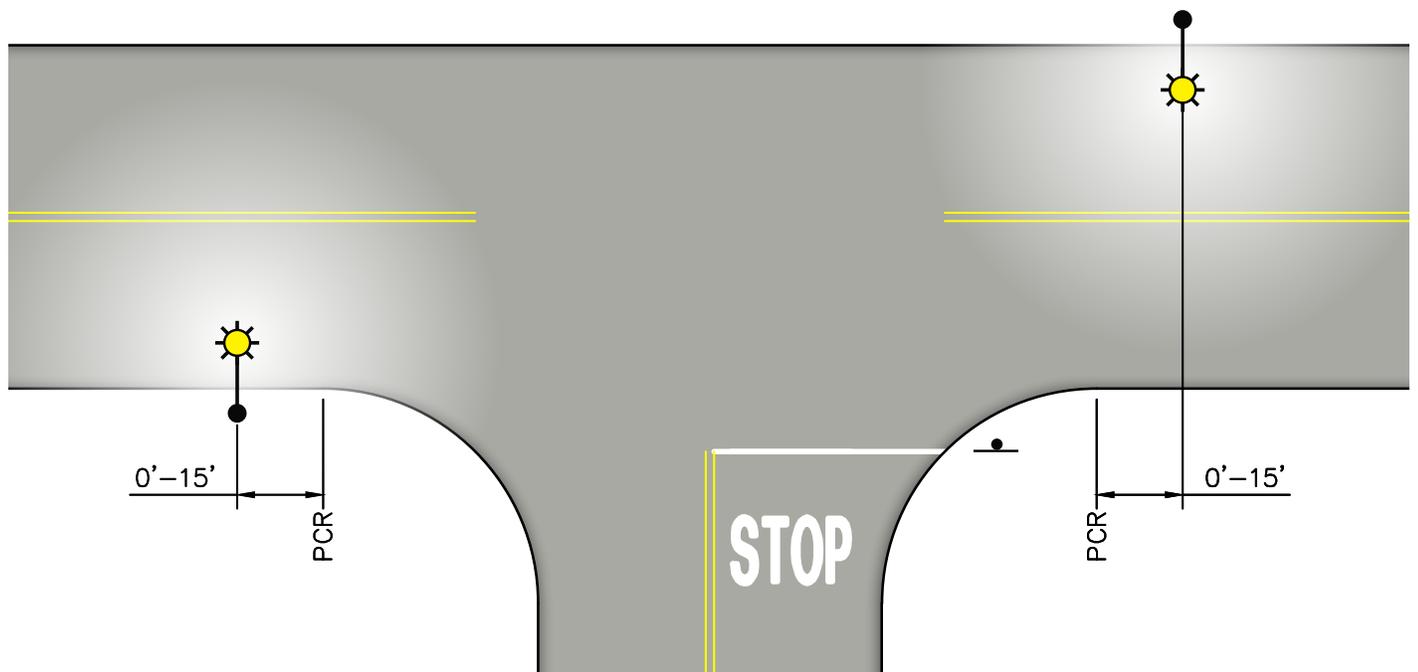
3.1.1 LOCAL/LOCAL INTERSECTIONS

GUIDELINES

T – Intersection

Two 5,500 pupil lumen street light standards should be placed diagonally from one another on the local street that extends in two directions. Street light standards should be placed 0' to 15' from the point of curb return on the approach sides of the intersection.

FIGURE



Lighting at Local/Local T – Intersections

3.2 CONTINUOUS PEDESTRIAN LIGHTING

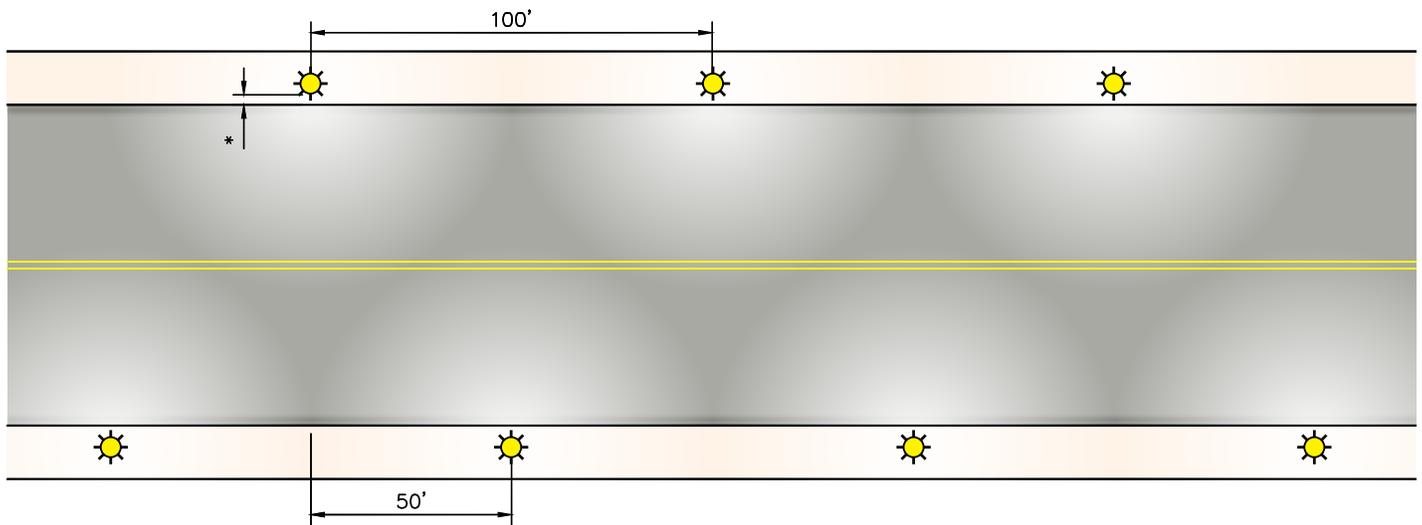
Pedestrian scale lighting primarily functions to illuminate pedestrian walkways such as sidewalks. Continuous pedestrian lighting recommendations are intended to avoid “dark spots” in the walkways. Nevertheless, following the design parameters and light spacing in these guidelines would provide light levels in the roadway that meet or exceed those provided by the current City of Carlsbad lighting criteria in Section 10, “Street Lights” of Chapter 3 – Public Street and Traffic Standards in the *City of Carlsbad Engineering Standards*. Therefore, continuous pedestrian lighting can be installed without continuous street lighting.

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Pedestrian light standards should be staggered, with a maximum 100’ spacing between lights on the same side of the street and a maximum 50’ spacing between lights on opposite sides of the street. Light standards should have a minimum of 7,400 pupil lumen on commercial streets and a minimum of 3,800 pupil lumen on local streets.

Light pole spacing may vary $\pm 10'$ to account for field conditions. Poles shall be sited to ensure that a clear 4’ walkway width is maintained, and be placed in locations where lighting will not be disrupted by existing trees.

FIGURE



* See City of Carlsbad Standard Drawings for minimum offset distance.

Continuous Pedestrian Lighting

3.3 ROUNDABOUTS AND MINI ROUNDABOUTS

In designing lighting at roundabouts and mini roundabouts, strict conformance to national light level recommendations shall be applied due to the geometric design of these unsignalized intersections.

Lighting for roundabouts including mini roundabouts shall be designed as specified in the latest edition of NCHRP Report No. 672: *Roundabouts: An Informational Guide*.

The following amendments to the latest edition of NCHRP Report No. 672: *Roundabouts: An Informational Guide* are incorporated into these guidelines:

Lighting Levels

The lighting levels for roundabouts and mini roundabouts shall conform to those recommended in the latest edition of NCHRP Report No. 672: *Roundabouts: An Informational Guide*. Refer to Section 8.3, "Lighting Levels" of NCHRP Report No. 672: *Roundabouts: An Informational Guide – Latest Edition* for additional information.

Street Light Standards

Section 8.4.1, "Equipment Type", shall be deleted in its entirety. For the illumination equipment to be used at roundabouts, refer to Section 10, "Street Lights" of Chapter 3 – Public Street and Traffic Standards in the *City of Carlsbad Engineering Standards*.

Pole Location

Street light standards shall be placed around the perimeter of the roundabout and at locations on the approach side of the pedestrian crossings. Street light poles shall not be placed in the center island. Pedestrian crossings at roundabouts shall be lit with pedestrians in positive contrast, thereby making pedestrians more visible to the driver. Light poles shall be placed 10' to 30' prior to the pedestrian crossing from the perspective of the driver. Refer to Section 8.4.2, "Pole Locations" of NCHRP Report No. 672: *Roundabouts: An Informational Guide – Latest Edition* for additional information.

Center Island Feature/Landscaping Uplighting

Center island landscaping and features shall be up-lit to better enhance visibility of the roundabout to drivers. Uplighting shall be designed to conform to California Title 24 requirements. An electrical service separate from the roundabout roadway lighting shall be required for uplighting.

Approach Roadways

For street and pedestrian lighting on approach roadways, refer to Section 10, "Street Lights" of Chapter 3 – Public Street and Traffic Standards in the *City of Carlsbad Engineering Standards* and the "Continuous Pedestrian Lighting" section of these guidelines.

3.3.1 TRAFFIC CIRCLES

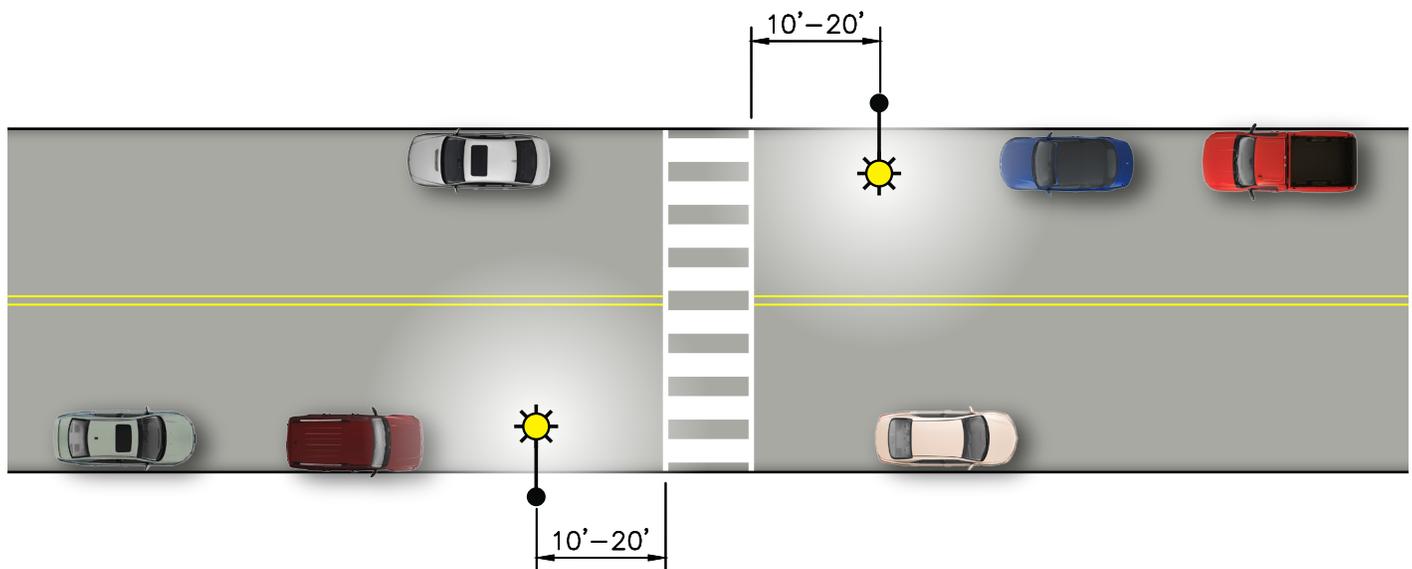
Lighting for traffic circles shall conform to the same standards as roundabout lighting. For traffic circle lighting, refer to the "Roundabouts and Mini Roundabouts" section of these guidelines.

3.4 UNCONTROLLED MIDBLOCK PEDESTRIAN CROSSINGS

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At midblock pedestrian crossings, two 13,700 pupil lumen street light standards should be installed. According to FHWA Publication No. FHWA-HRT_08-03 – *Informational Report on Lighting Design for Midblock Crosswalks*, two street light standards should be placed on either side of the road and located 10' to 20' prior to the midblock pedestrian crossing from the perspective of the driver. This will illuminate pedestrians in positive contrast making them more visible to drivers.

FIGURE



Lighting for Uncontrolled Midblock Pedestrian Crossings

3.5 DRIVEWAYS

Light standards near driveway entrances should be placed at least 3' from the driveways to maintain a sufficient clear zone for vehicles entering and exiting driveways.

3.6 ALLEYS

Light standards should be placed in alleys in accordance with the street light criteria for local streets in Section 10, "Street Lights" of Chapter 3 – Public Street and Traffic Standards in the City of Carlsbad Engineering Standards. In narrow alleys with right of way restrictions and installation of street light poles is not feasible, opportunities to mount mast arms on existing power poles should be evaluated.