RESOLUTION NO. 2024-11

A RESOLUTION OF THE ALBANY CITY COUNCIL ACCEPTING THE STREETLIGHTING GUIDELINES AND NEAR-TERM RECOMMENDATIONS PERFORMED UNDER CONTRACT NO. C23-21 (CIP NO. 25008)

WHEREAS, the City of Albany desires to evaluate lighting conditions throughout the City, and identify potential improvements for safety and comfort for all travelers; and

WHEREAS, on November 16, 2020, the City Council adopted Resolution No. 2020-108, approving the updated five-year Capital Improvement Plan for Fiscal Years 2019/20 through 2023/24, and appropriating budget for the first three fiscal years of the plan, including funding for the Citywide Streetlighting Evaluation Project (CIP No. 25008); and

WHEREAS, on March 20, 2023, the City Council awarded Contract No. C23-21 to Clanton & Associates for the Citywide Streetlighting Evaluation Project; and

WHEREAS, Clanton & Associates have substantially completed the tasks and deliverables required under the Citywide Streetlighting Evaluation Project.

NOW, THEREFORE, BE IT RESOLVED, that the Albany City Council hereby accepts the streetlighting guidelines and near-term lighting recommendation included in the Citywide Streetlighting Evaluation project.

JOHN MIKI, MAYOR

STREET LIGHTING LAYOUTS FOR ARTERIALS

Several arterial streets traverse Albany. These routes primarily serve through traffic and secondarily provide access to abutting property. Traffic on these streets is likely to be moving at higher speeds and later into the nighttime hours than other street classifications. When continuous lighting is warranted, the design must meet the lighting criteria set forth by IES RP-8-22.

The table below details the appropriate lighting strategy for each land use an arterial street may be adjacent to in Albany.

MARIN AVENUE - ARTERIAL

Arterial								
Adjacent Land Use	**Zone Designations**	**Lighting Layout Option**	**Layout Type**	**Maximum CCT**	**Street Light Type**	**Spacing Range (ft)**	**Lumen Output Range (lumens)**	**Mounting Height (ft)**
Solano and San Pablo Commercial and Public Facilities	SC, SPC, PF	Street Lighting	Continuous***	2700K	S1	150-180	10,000-14,000	30
		Pedestrian Lighting	Continuous***	2700K	P1	30-60	2,500-3,500	12-15
		Street Lighting & Pedestrian Lighting**	Continuous***	2700K	S1 & P1	120-180	10,000-14,000 2,500-3,500	30 12-15
Commercial Mixed Use	CMX	Street Lighting	Non-Continuous	2700K	S2	N/A	8,000-12,000	30
		Street Lighting	Intersections Only	2700K	S2	N/A	8,000-12,000	30
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Street Lighting	Continuous***	2700K	S1	150-180	10,000-14,000	30
		Pedestrian Lighting	Continuous***	2700K	P1	30-60	2,500-3,500	12-15
		Street Lighting & Pedestrian Lighting**	Continuous***	2700K	S1 & P1	120-180	10,000-14,000 2,500-3,500	30 12-15
Residential - Low and Medium Density	R-1, R-2	Pedestrian Lighting	Continuous*	2700K	P1	30-60	2,500-3,500	12-15
		Street Lighting	Non-Continuous	2700K	S2	300-400	8,000-12,000	30
		Pedestrian Lighting	Non-Continuous	2700K	P1	90-150	2,500-3,500	12-15

* Only with Driveways facing the Arterial or bike lanes when posted speeds are > 30 mph
**Spacing is for alternating Pedestrian and Street lights
***Continuously lit Arterial roadway spacings are based on lights arranged opposite each other on both sides of the roadway

STREET LIGHTING LAYOUTS FOR COLLECTORS

There are collector streets throughout Albany. These routes serve residential and commercial areas. They also make connections to schools in the City. Traffic on these streets is likely to vary throughout the day. When continuous lighting is warranted, the design must meet the lighting criteria set forth by IES RP-8-22.

The table below details the appropriate lighting strategy for each land use a collector street may be adjacent to in Albany.

MASONIC AVENUE - COLLECTOR

Collector								
Adjacent Land Use	**Zone Designations**	**Lighting Layout Option**	**Layout Type**	**Maximum CCT**	**Street Light Type**	**Spacing Range (ft)**	**Lumen Output Range (lumens)**	**Mounting Height (ft)**
Public Facilities	PF	Street Lighting	Continuous**	2700K	S2	180-230	8,000-12,000	30
		Pedestrian Lighting	Continuous***	2700K	P1	30-60	4,000-6,000	12-15
		Street & Pedestrian Lighting*	Continuous**	2700K	S1 & P1	80-120	8,000-12,000 4,000-6,000	30 12-15
Commercial Mixed Use	CMX	Street Lighting	Non-Continuous	2700K	S3	300-400	6,000-10,000	30
		Street Lighting	Intersections Only	2700K	SG3	N/A	6,000-10,000	30
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Street Lighting	Continuous**	2700K	S2	180-230	8,000-12,000	30
		Pedestrian Lighting	Continuous***	2700K	P2	30-60	4,000-6,000	12-15
Residential - Low and Medium Density	R-1, R-2	Street Lighting	Non-Continuous	2700K	S3	150-240	6,000-10,000	30
		Street Lighting	Intersections Only	2700K	SG3	N/A	6,000-10,000	30
		Pedestrian Lighting	Non-Continuous	2700K	P2	90-150	4,000-6,000	12-15
Residential adjacent to the Greenway	R-1, R-2, R-3	Pedestrian Lighting	Continuous***	2700K	P2	60-90	3,000-5,000	12-15

* Spacing is for alternating Pedestrian and Street lights
**Continuously lit Collector roadway spacings with streetlights are based on poles located on a single side of the roadway
***Continuously lit Collector roadway spacings with pedestrian lights are based on poles arranged opposite each other on both sides of the roadway

STREET LIGHTING LAYOUTS FOR LOCAL ROADS

There are local streets throughout Albany which tend to be quite narrow. These routes serve residential neighborhoods. Traffic on these streets is slower with less activity at night. When continuous lighting is warranted, the design must meet the lighting criteria set forth by IES RP-8-22.

The table below details the appropriate lighting strategy for each land use a local street may be adjacent to in Albany.

NEILSON STREET - LOCAL

Local								
Adjacent Land Use	**Zone Designations**	**Lighting Layout Option**	**Layout Type**	**Maximum CCT**	**Street Light Type**	**Spacing Range**	**Lumen Output Range**	**Mounting Height**
Public Facilities	PF	Street Lighting	Continuous**	2700K	S3	170-200	6,000-10,000	25
		Pedestrian Lighting	Continuous***	2700K	P2	60-90	3,000-5,000	12-15
		Street Lighting & Pedestrian Lighting*	Continuous**	2700K	S3 & P2	80-120	6,000-10,000 3,000-5,000	25 12-15
Commercial Mixed Use	CMX	Street Lighting	Non-Continuous	2700K	S3	300-400	6,000-10,000	25
		Street Lighting	Intersections Only	2700K	SG3	N/A	6,000-10,000	30
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Street Lighting	Non-Continuous	2700K	S4	300-400	4,000-8,000	25
		Street Lighting	Intersections Only	2700K	SG3	N/A	6,000-10,000	30
		Pedestrian Lighting	Continuous***	2700K	P2	60-90	3,000-5,000	12-15
Residential - Low and Medium Density	R-1, R-2	Pedestrian Lighting	Non-Continuous	2700K	P2	120-200	3,000-5,000	12-15
		Street Lighting	Non-Continuous	2700K	S4	300-400	4,000-8,000	25
		Street Lighting	Intersections Only	2700K	SG3	N/A	6,000-10,000	30

* Spacing is for alternating Pedestrian and Street lights
**Continuously lit Local roadway spacings with streetlights are based on poles located on a single side of the roadway
***Continuously lit Local roadway spacings with pedestrian lights are based on poles arranged opposite each other on both sides of the roadway

INTERSECTION CRITERIA FOR ARTERIALS

The tables shown on this page provide guidance on street lighting for any arterial Intersection in Albany. Each type of intersection and its adjacent land use is given a minimum and preferred number of street lights to be provided. Each intersection is also given a luminaire typology code. These are expanded upon in the luminaire schedule on page 31.

Lighting at intersections should include multiple luminaires to provide appropriate coverage for the whole intersection. Larger intersections with higher pedestrian usage should have one street light at each corner of the intersection in order to provide full coverage. This is recommended for the majority of intersections involving arterial streets. The placement of lighting at these intersections should consider the vertical illuminance needed at crosswalks to provide adequate illumination of pedestrians crossing the street.

Arterial/Arterial

Adjacent Land Use	Zone Designations	Quantity of Intersection Lights	Maximum CCT	Intersection Light Type
Solano and San Pablo Commercial and Public Facilities	SC, SPC, PF	Three (3)* to four (4) at each corner	2700K	SG1
Commercial Mixed Use	CMX	Three (3)* to four (4) at each corner	2700K	SG1
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Three (3)* to four (4) at each corner	2700K	SG1
Residential - Low and Medium Density	R-1, R-2	Three (3)* to four (4) at each corner	2700K	SG1

* Four lights are preferred. Three are acceptable when it is not possible to locate a fourth light due to conflict with overhead lines, trees, or at T-intersections.

Arterial/Collector

Adjacent Land Use	Zone Designations	Quantity of Intersection Lights	Maximum CCT	Intersection Light Type
Solano and San Pablo Commercial and Public Facilities	SC, SPC, PF	Three (3)* to four (4) at each corner	2700K	SG1
Commercial Mixed Use	CMX	Three (3)* to four (4) at each corner	2700K	SG1
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Three (3)* to four (4) at each corner	2700K	SG1
Residential - Low and Medium Density	R-1, R-2	Three (3)* to four (4) at each corner	2700K	SG1

* Four lights are preferred. Three are acceptable when it is not possible to locate a fourth light due to conflict with overhead lines, trees, or at T-intersections.

Arterial/Local

Adjacent Land Use	Zone Designations	Quantity of Intersection Lights	Maximum CCT	Intersection Light Type
Solano and San Pablo Commercial and Public Facilities	SC, SPC, PF	Three (3)* to four (4) at each corner	2700K	SG1
Commercial Mixed Use	CMX	Two (2) to three (3) located at the major crossings	2700K	SG2
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Three (3)* to four (4) at each corner	2700K	SG1
Residential - Low and Medium Density	R-1, R-2	Two (2) to three (3) located at the major crossings	2700K	SG2

* Four lights are preferred. Three are acceptable when it is not possible to locate a fourth light due to conflict with overhead lines, trees, or at T-intersections.

INTERSECTION CRITERIA FOR COLLECTOR & LOCAL

The tables shown on this page provide guidance on street lighting for any collector or local Intersection in Albany. Each type of intersection and its adjacent land use is given a minimum and preferred number of street lights to be provided. Each intersection is also given a luminaire typology code. These are expanded upon in the luminaire schedule on page 31.

Lighting at intersections should include multiple luminaires to provide appropriate coverage for the whole intersection. One luminaire is only sometimes sufficient for smaller, local/local intersections. Larger intersections with higher pedestrian usage should have one street light at each corner of the intersection in order to provide full coverage. The placement of lighting at these intersections should consider the vertical illuminance needed at crosswalks to provide adequate illumination of pedestrians crossing the street.

Collector/Collector

Adjacent Land Use	Zone Designations	Quantity of Intersection Lights	Maximum CCT	Intersection Light Type
Public Facilities	PF	Three (3)* to four (4) at each corner	2700K	SG1
Commercial Mixed Use	CMX	Two (2) to three (3) located at the major crossings	2700K	SG2
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Three (3)* to four (4) at each corner	2700K	SG1
Residential - Low and Medium Density	R-1, R-2	Two (2) to three (3) located at the major crossings	2700K	SG2
Residential adjacent to the Greenway	R-1, R-2, R-3	Two (2) to three (3) located at the major crossings	2700K	SG2, SG3

* Four lights are preferred. Three are acceptable when it is not possible to locate a fourth light due to conflict with overhead lines, trees, or at T-intersections.

Collector/Local

Adjacent Land Use	Zone Designations	Quantity of Intersection Lights	Maximum CCT	Intersection Light Type
Public Facilities	PF	Two (2) to three (3) located at the major crossings	2700K	SG2
Commercial Mixed Use	CMX	Two (2) to three (3) located at the major crossings	2700K	SG2, SG3
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Two (2) to three (3) located at the major crossings	2700K	SG2
Residential - Low and Medium Density	R-1, R-2	Two (2) to three (3) located at the major crossings	2700K	SG2, SG3

Local/Local

Adjacent Land Use	Zone Designations	Quantity of Intersection Lights	Maximum CCT	Intersection Light Type
Solano and San Pablo Commercial and Public Facilities	SC, SPC, PF	Two (2) to three (3) located at the major crossings	2700K	SG2, SG3
Commercial Mixed Use	CMX	One (1) or Two (2) located on opposite corners	2700K	SG3
Residential - Medium and High Density, Towers and Hillside	R-2, R-3, R-4, RHD	Two (2) to three (3) located at the major crossings	2700K	SG2, SG3
Residential - Low and Medium Density	R-1, R-2	One (1) or Two (2) located on opposite corners	2700K	SG3

LIGHTING CLASS 1 BIKEWAYS

Class I Bikeways provide increased opportunities for commuting by bicycle, allowing higher speeds and providing less potential conflicts along routes than other bike path types. When located in a park or greenway setting there is potential for conflict with pedestrians. With this in mind, continuous lighting is recommended along Class I Bikeways within the City of Albany.

Along the Ohlone Greenway, existing lighting on the elevated BART structure already provides a continuous level of lighting along the majority of the bikeway. Other Class I Bikeways in Albany may be receiving some contribution of light from the adjacent street lighting. Where the adjacent existing lighting does not adeqautely meet the Walkway and Bikeway Lighting Criteria, this study recommends providing additional pedestrian scale lighting to meet this criteria.

The table below details the appropriate lighting strategy for Class I Bikeways, based on trail use rates.

Class I Bikeways							
Pedestrian & Cyclist Activity	**Lighting Layout Option**	**Layout Type**	**Maximum CCT**	**Street Light Type**	**Spacing Range**	**Lumen Output Range**	**Mounting Height**
Medium	Pedestrian Lighting	Continuous	2700K	P1	60-90	2,500 - 3,500	12-15
Low	Pedestrian Lighting	Continuous	2700K	P2	80-120	1,500 - 2,500	12-15

OHLONE GREENWAY BIKE PATH

EXAMPLE OF BIKEWAY LIGHTING

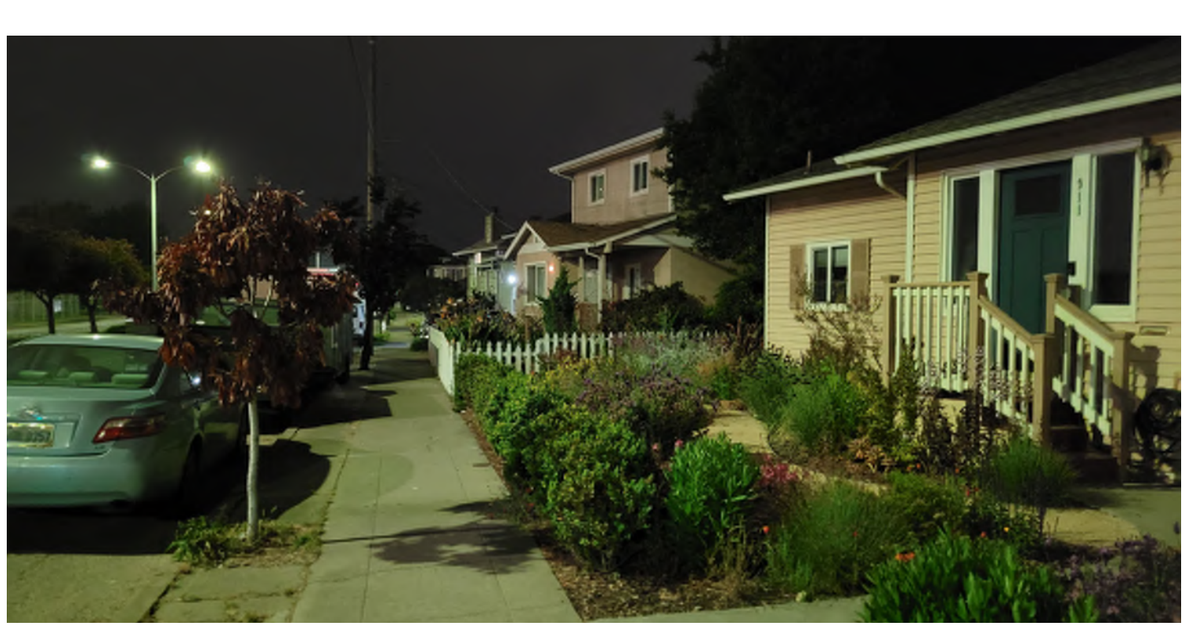
EXAMPLE OF TRAIL LIGHTING

CITYWIDE CRITERIA

These tables shown on this page provide light level criteria for streets, walkways & bikeways, and intersections.

Street lighting criteria is expressed in luminance (L), which is measured through candela per square meter (cd/m2). This represents the brightness of light reflected off of the roadway's surface. Luminance calculations must account for different street pavement reflectance properties of concrete or asphalt and their ages. Albany's typical street surface has been accounted for in these charts.

Walkways, bikeways and intersection lighting criteria is expressed in illuminance (E), which is measured through lumens per square foot using footcandles (fc), which represents light falling onto the surface and does not require any surface reflectance properties to calculate.



BUCHANAN STREET - LIGHT TRESPASS

Street Lighting Criteria

Street Classification	Pedestrian Activity	Avg Luminance Lavg (cd/m²)	Avg Uniformity L Avg/Min	Max Uniformity L Max/Min
Arterial	Med	0.9	3.0	5.0
Arterial	Low	0.6	3.5	6.0
Collector	Med	0.6	3.5	6.0
Collector	Low	0.4	4.0	8.0
Local	Med	0.5	6.0	10.0
Local	Low	0.3	6.0	10.0

Walkway & Bikeway Lighting Criteria

Pedestrian Activity	Avg Illuminance (Horiz) Eavg (fc)	Avg Illuminance (Vert) Eavg (fc)	Avg Uniformity Eavg/ Emin
Medium	0.5	0.2	5.0
Low	0.2	0.1	10.0

Intersection Lighting

Pedestrian Activity

Street Classification 1	Street Classification 2	Avg Illuminance (Horiz) Eavg (fc)		Avg Illuminance (Vert) Eavg (fc)		Avg Uniformity Eavg/Emin
		Medium	Low	Medium	Low	
Arterial	Arterial	2.4	1.7	1.7	1.2	3.0
Arterial	Collector	2.0	1.4	1.4	1.0	3.0
Arterial	Local	1.9	1.2	1.3	0.8	3.0
Collector	Collector	1.7	1.1	1.2	0.8	4.0
Collector	Local	1.5	0.9	1.1	0.6	4.0
Local	Local	1.3	0.7	1.4	0.5	6.0

LUMINAIRE SCHEDULE

The following table details the recommended specifications for each type of luminaire that could be used for street lighting in Albany. These luminaire specifications describe the minimum quality requirements for lighting equipment in order for Albany's street lighting to minimize contribution to light trespass or light pollution. All recommended luminaire types are using a CCT of 2700K or lower.

Some of the types shown here as distinct could potentially be satisfied by the same luminaire in order to reduce variety in the lighting inventory and improve maintenance response times.

Streetlight Typologies

Luminaire Type Name	Luminaire Type	Adjacent Land Use	Street Classification	Maximum CCT	Maximum Luminaire Lumen Output	Spacing Range* (ft)	Maximum BUG Rating	Distribution	Shielding Accessories	Mounting Height
S1	Streetlight	SC, SPC, PF, R-2, R-3, R-4, RHD	Arterial	2700K	12,000-16,000	150-200	B2-U0-G2	Type 2 or 3	House side shield near residential	25-30ft.
S2	Streetlight	SC, SPC, PF, R-1, R-2, R-3, R-4, RHD, CMX	Arterial or Collector	2700K	8,000-12,000	150-230	B2-U0-G2	Type 2	House side shield near residential	25-30ft.
S3	Streetlight	PF, R-2, R-3, R-4, RHD, CMX	Collector or Local	2700K	6,000-10,000	150-240	B1-U0-G1	Type 2	House side shield near residential	25-30ft.
S4	Streetlight	PF, R-1, R-2, R-3, R-4, RHD, CMX	Collector or Local	2700K	4,000-8,000	170-240	B1-U0-G1	Type 2	80° shield, House side shield	25ft.
P1	Pedestrian Light	R-1, R-2, CMX	Arterial or Collector	2700K	2,500-3,500	60-90	B1-U0-G1	Type 2	80° shield, House side shield	12-15ft.
P2	Pedestrian Light	R-1, R-2, CMX	Local	2700K	1,500-2,500	60-90	B1-U0-G1	Type 2	80° shield, House side shield	12-15ft.
SG1	Intersection Light	SC, SPC, PF, R-2, R-3, R-4, RHD	Arterial	2700K	14,000-16,000	3-4 at Intersection	B2-U0-G2	Type 3 or 4	House side shield near residential	25-30ft.
SG2	Intersection Light	SC, SPC, PF, R-1, R-2, R-3, R-4, RHD, CMX	Arterial or Collector	2700K	10,000-14,000	3-4 at Intersection	B2-U0-G2	Type 3	House side shield near residential	25-30ft.
SG3	Intersection Light	PF, R-1, R-2, R-3, R-4, RHD, CMX	Collector or Local	2700K	6,000-10,000	1-3 at Intersection	B1-U0-G1	Type 2	80° shield, House side shield	25ft.

* Spacing Range is based on a range to achieve continuous lighting. For non-continuous lighting increase spacing by 1.5 to 2 times.

"Near-term" recommendations would mostly utilize existing funding and budgets, where staff can begin planning or implementing improvements immediately. These are generally low complexity improvements which can be incorporated in the course of maintenance work to replace failing lights, including installing appropriate shielding and luminaires with 2700K as the standard color temperature. Other lower complexity improvements will require slightly more coordination, including trimming trees/adjusting mast arms at tree conflict locations or small projects to address lighting at various "critical" intersections identified in the report.

City of Albany

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RESOLUTION NO. 2024-11

PASSED AND APPROVED BY THE COUNCIL OF THE CITY OF ALBANY,

The 5th day of February, 2024, by the following votes:

AYES: Council Members Hansen-Romero, Jordan, López, Tiedemann and Mayor Miki

NOES: none

ABSENT: none

ABSTAINED: none

RECUSED: none

WITNESS MY HAND AND THE SEAL OF THE CITY OF ALBANY, this 6th day of February, 2024.

Anne Hsu
CITY CLERK