

DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

Introduction

The following is a review of the role lighting plays in creating a walkable city. The Seattle Pedestrian Master Plan examined City of Seattle policies and practices related to the pedestrian environment and experience, specifically focusing on the American Disabilities Act (ADA) transition plan, construction zones, lighting, intersection design, maintenance, snow and icy conditions, speed and signage, street types, and trees and sidewalks. This process was also informed by discussions with staff of the Inter-Agency Team¹ and the Pedestrian Master Plan Advisory Group².

Lighting in the public right-of-way has a variety of forms and sources. It may occur in the form of taller street lights, shorter lights installed above pedestrian walkways, lighting that accentuates features on a building façade, in-pavement/ground, lighting, catenary or hanging lights, and illumination that flows outward from the inside of buildings. Lighting promotes perceived personal security for pedestrians walking at night, helps make pedestrians more visible to motor vehicles, and can help create a vibrant and attractive evening streetscape. Many pedestrians cite concerns about a lack of lighting as a reason they do not feel comfortable walking at night. The importance of lighting in regards to personal security, and as a tool to enhance the pedestrian environment, is highlighted in the goals in nearly a third of the adopted Neighborhood Plans described in the City of Seattle's Comprehensive Plan.

The choice and installation of lighting involves some important considerations. Orientation and placement of lighting can reduce or increase the amount of light that is emitted toward its target. Street lighting generally has tall poles (~35-feet) with an arm that extends outward and focuses lighting on the middle of the street, often above tree canopies. Although these lights can be helpful in illuminating pedestrian crossings, they can also create dark shadows in the sidewalk area or miss the pedestrian zone completely. Pedestrian scaled lighting generally has shorter poles (~12-15-feet) with no arms, is placed below tree canopies, and focuses light on the sidewalk.

Civil Engineering
Landscape Architecture
Environmental Restoration
Planning

1205 Second Avenue
Suite 200
Seattle, WA 98101

Phone: 206.223.0326
Fax: 206.223.0125
svr@svrdesign.com

¹ The Inter-Agency Team consists of staff from eighteen agencies and departments within the City of Seattle, King County, and Washington State.

² The Pedestrian Master Plan Advisory Group (PMPAG) is an ad hoc group appointed by the City of Seattle, consisting of twenty-three members representing various groups and organizations.

DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

Besides concerns about perceived personal security, light that is emitted upwards or away from its target may produce what is known as light or night sky pollution. Large cities are often major sources of light/night sky pollution. This may result in wasted energy, make it difficult to see the stars, and may have negative effects on human sleep patterns, bird migration, salmon migration and survival rates, and insect populations (Scigliano, 2008). City of Seattle standards for new street lighting specify lenses that should minimize these negative effects. However, a number of street lights on arterials might still contain the older types of lenses that cause glare and produce light/night sky pollution. In 2002, City Light's Lighting Design Lab "began testing efficient, bulb-saving induction technology in streetlights, and it lately has begun trials of...low-glare, high-efficiency LEDs" (Scigliano, 2008, p.122). Besides City Light's technology testing, the International Dark-Sky Association (IDA) provides a product list of "approved dark sky friendly" lights for a variety of lighting types, including street, pedestrian, and façade (IDA, 2008).

Current Programs and Goals

According to Seattle City Light's website, the publicly owned utility operates and maintains over 100,000 street lights in the City of Seattle (Seattle City Light, 2008). However, a recent article in *Seattle Metropolitan* cites an inventory that found the number of street lights to be closer to "83,835—about one for every seven Seattleites" (Scigliano, 2008). The Seattle Department of Transportation (SDOT) is responsible for lighting levels and permitting for street and pedestrian lighting (ROWIM, 4.16).

City of Seattle Comprehensive Plan

The following nine (out of 33) adopted neighborhood plans contain goals or policies related to pedestrian scaled lighting: Admiral, Aurora-Licton, Bitter Lake, Columbia City, Downtown, Greenwood/Phinney, MLK at Holly, North Neighborhoods, and Queen Anne.

City of Seattle Transportation Strategic Plan (TSP)

The TSP recommends pedestrian scaled lighting for Main Street Types. Improved lighting is suggested as a strategy to make transit stops more comfortable and visible and to improve pedestrian safety and access to transit. Better lighting is also recommended to improve safety at pedestrian crossings. The TSP also recommends that sustainable design concepts related to street lighting be incorporated into City policy and practice in order to meet objectives of the Sustainable Infrastructure Initiative.

Seattle City Light – Streetlight Trouble Reporting

Seattle City Light (SCL), responsible for operation and maintenance of street lights in Seattle, has a program called "Streetlight Trouble Reporting" that allows residents to report lights that are out or are malfunctioning. When filing a report, by telephone or through an online form, it is necessary to note the problematic light pole number and the nearest address to it.

Non-standard or private lighting in the right-of-way create maintenance challenges for SCL because they do not have the parts in stock to fix them. In some cases the building owner may maintain these non-standard lights,

DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

but SCL receives the calls or online forms requesting repairs because the public does not know the lights are privately owned and maintained.

Applicable/Related Regulations – Guidelines

Department of Planning and Development (DPD) – Design Review Guidelines for Multi-family and Commercial Buildings

Multi-family and commercial buildings that go through Design Review with DPD are expected to provide “appropriate levels of lighting...in order to promote visual interest and a sense of security” (Guideline D-10).

Applicants are encouraged to consider some of the following lighting strategies:

- Illuminate distinctive features of the building, including entries, signage, canopies, and areas of architectural detail and interest.
- Install lighting in display windows that spills onto and illuminates the sidewalk.
- Orient outside lighting to minimize glare within the public right-of-way or in adjacent property (DPD, 2008).

In addition to the multi-family and commercial building design guidelines, there are also neighborhood specific design guidelines. Many of these neighborhood design guidelines provide criteria on pedestrian-scaled lighting. These include: Belltown, Greenwood/Phinney, Northgate, North District/Lake City, Northgate Urban Center Overlay District, Wallingford, South Lake Union, North Beacon Hill, Othello, Morgan Junction, and West Seattle Junction.

Right of Way Improvement Manual (ROWIM)

Chapter 4.16.2 of the ROWIM provides design criteria for lighting on non-arterial and arterial streets, and for pedestrian lighting. Lighting on non-arterial and arterial streets is required to meet the most recent edition of Illumination Engineering Society (IES) standards. For pedestrian walkways adjacent to roadways, the ROWIM states that, “Pedestrian lighting illuminates the pedestrian walkway and is typically located 12-15 feet above the sidewalk.” New lighting on pedestrian walkways, not adjacent to a roadway, “should have 2.0 maintained foot candles (where practical).” Foot candle refers to the distance (in feet) that is illuminated away from the source of light. A Pedestrian Lighting Standard Section (ROWIM, 4.16.2) provides four examples of lamp types, two types of poles and bases, and four color options for the poles and bases with the preapproved manufacturer Lumec.

Chapter 4.2.1 of the ROWIM refers to street lighting and pedestrian scaled lighting in its list of design features for various Street Types. Street lighting is only addressed for the Neighborhood Green Street Type outside of downtown; the ROWIM recommends “pedestrian scaled lighting that lights the sidewalk, especially on streets leading to schools, community centers or transit stops.” The ROWIM provides the following recommendations for pedestrian scaled lighting in relation to Street Types:

- Regional Connector, Commercial Connector, and Local Connector: “Prioritize at pedestrian crossing locations, in transit zones, where

DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

there are concerns about personal security, and in where adjacent land uses support pedestrian activity.”

- Main Street Arterial: “Pedestrian scaled lighting lights the sidewalk and provides a consistent vertical design element to the streetscape. Prioritize at pedestrian crossing locations, in transit zones, where there are concerns about personal security, and in where adjacent land uses support pedestrian activity.”
- Green Street in Downtown Seattle and Neighborhood Green Street outside of Downtown Seattle: “Pedestrian scaled lighting that lights the sidewalk and provides a consistent vertical design element to the streetscape.”

City of Seattle Standard Specifications for Road, Bridge, and Municipal Construction (2008)

- Section 9-31.1(2) provides specifications for roadway lighting luminaries that include, “glare control shall be accomplished by use of flat lens. Minimum streetside utilization shall be 39 percent at 1.5 transverse mounting height. Distribution shall be free from striations and hotspots” (p. 9-112).
- Section 9.33.1(1) provides specifications for “poles, mast arms, and luminaire arms.”

City of Seattle Standard Plans for Municipal Construction (2008)

- Standard Plan No. 572: Steel Street Light Pole with Bracket Arm (note: mounting light height is 35-feet +/-).

Seattle City Light Engineering Standards (2005-2008)

- Stock Catalog No. 57: Streetlight Equipment for Historical Districts Globe Fixtures
- Material Standard No. 5745.0: Fiberglass Streetlight Poles
- Material Standard No. 5680.0: Ornamental Cast Base and Collar, Aluminum for street light standards
- Construction Guideline Standard No. D12-11/NSL-40: High Intensity Arterial and Residential Streetlighting – Photoelectric Control
- Construction Guideline No. SL10-2/NSL-50: Arterial and Residential Street Lighting Installation Details for Anchor Base Aluminum Standard Mast Arm Luminaire with PE Control

U.S. Department of Transportation - Federal Highway Administration (2008. Informational Report on Lighting Design for Mid-Block Crosswalks

“Provide(s) information to traffic engineers and lighting designers regarding lighting parameters that impact the ability of drivers to see pedestrians in mid-block crosswalks and to enable agencies to evaluate the potential effectiveness of lighting designs” (p.1).

- Chapter two provides detailed background regarding visibility concepts such as vertical illuminance, luminance, diffuse reflection, contrast, and visibility level.
- Chapter three describes crosswalk lighting design considerations, including vertical illuminance, luminaire selection and placement, crosswalk placement, and other considerations such as glare, lamp type, and crosswalks at intersections.

DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

Best Practices

Cities such as Philadelphia and Montreal have implemented lighting plans that focus on specific neighborhoods or districts (such as a historic district). While these are valuable references, below are two examples of lighting plans that aim to reduce light pollution using a more city-wide approach.

- Chicago: In response to the environmental and social effects of light pollution, some cities are adopting programs to reduce the amount of light that is misdirected. For example, the City of Chicago's Green Alley Handbook encourages the installation of "Dark Sky Lighting," which directs light "downward and outward" rather than upward in order to save energy, money, and reduces unwanted light glare (City of Chicago, n.d.).
- Auckland City Council (2007), New Zealand – provides a best practice guide for pedestrian scaled lighting that includes dark-sky friendly technology.

Gaps/Additions/Modifications

General Comments:

- The University District Community Design Guidelines make no reference to pedestrian-scaled lighting. This is a significant gap, considering the University District is an area where there are many pedestrians due to high residential density and a large student population. Crime is also a concern in this neighborhood.
- Other neighborhood design guidelines with less emphasis on pedestrian-scaled lighting include: Admiral, Ballard, Capitol Hill, Green Lake, Pike/Pine, and Roosevelt.
- cursory examination of ROWIM (4.16.2) pedestrian scaled lighting section (preapproved manufacturer list (Lumec)) suggests City of Seattle recommended pedestrian lighting does not meet International Dark-Sky Association pedestrian lighting "approved dark-sky friendly" standards.

The following gaps/additions/modifications related to lighting were identified in Inter-Agency Team, PMPAG, and SDOT/SvR/TDG Team meetings:

Flexibility

- There are only a select number of pole, fixture and base design types allowed; there is a desire and need for more options.
- The placement of light poles should be flexible to better account for pedestrian pathways and other features within the right-of-way.
- City Light's standard hand holes and vaults for energizing lighting limit design options due to their size and dimensions; alternatives should be considered.

Multi-Use

- The need for lighting that serves multiple purposes should be addressed.

DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

- Current lighting standards, designs, and practice focus on lighting the street, not the sidewalk; changes should be considered to better serve all users.

Location Specific Needs

More and better lighting is needed to connect neighborhoods and arterial roads, shared or multi-use trails, etc.

- The lighting of stairs is crucial to provide better access to arterials.
- There is a need for more lighting in areas with high pedestrian traffic.
- Lighting at underpasses and overpasses should be improved.
- The need for more lighting around transit stops and stations should be examined.

Coordination and Planning

There needs to be better coordination between SDOT, SCL, and DPD regarding lighting design standards, design review, permitting, installation, inspection, and maintenance.

- Not clear to designers whether to use SDOT or SCL standards for street lighting (standards are different); not clear who is responsible for design review and inspection; not clear whether SDOT or DPD or both review and permit designs for privately owned lighting that is placed within the right-of-way.
- Many light poles will need to be replaced in the near to medium-term, this may offer an opportunity to improve design and placement decisions.
- The Transportation Strategic Plan should discuss pedestrian lighting in more detail.
- There are lighting standards for new construction but no details for retrofitting lighting; this issue should be examined.
- More money for street tree maintenance will also improve lighting conditions.
- Improvement of standards for lighting placement, to ensure higher quality of light and ADA access, are needed.

Potential Recommendations for Review

- Facilitate coordination between SDOT, SCL, and DPD regarding lighting design standards, design review, permitting, installation, inspection, and maintenance.
 - Determine who is responsible for what part of process or for what areas of the right-of-way. Once decisions are made, communicate them both internally (SDOT, SCL, and DPD) and externally (e.g. to the design community) to make it easier for designers to navigate the permitting and inspection process.
- Revise neighborhood design guidelines, with few or no mentions of pedestrian scaled lighting, to include more detail in this area. These

DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

neighborhoods include: Admiral, Ballard, Capitol Hill, Green Lake, Pike/Pine, Roosevelt, and the University Community.

- Review Municipal and Seattle City Light lighting standards to determine whether they meet International Dark-Sky Association “approved dark sky friendly” standards.
- Incorporate sustainable design (e.g. energy efficiency), and low glare features into lighting standards, designs, and practices.
 - Use replacement programs of outdated or non-functioning lighting as an opportunity to incorporate these sustainable and low glare features into the City’s lighting system.
- Consider creating more options for pole, fixture and base design types, lighting pole placement criteria to enhance pedestrian lighting, and box and vault types.
- Lighting guidelines, designs, and practices should be revisited to determine whether they are meeting the needs of all users (specifically pedestrians and people with disabilities).
- Re-examine planning goals related to lighting in neighborhoods, stairs, overpasses and underpasses, and transit stops; establish implementation strategies to improve lighting where needed.
- Create guidelines for lighting retrofits.
- Examine lighting and street tree maintenance funding programs.

Links as applicable

- Pedestrian Lighting Standard Section (ROWIM, 4.16.2): [Refer to Figure 4-21 Pedestrian Lighting Sections](#).
- *City of Seattle Standard Plans for Municipal Construction (2008)*
 - Standard Plan No. 572
- *Seattle City Light Engineering Standards (2005-2008)*
 - Stock Catalog No. 57: Streetlight Equipment for Historical Districts Globe Fixtures
 - Material Standard No. 5745.0: Fiberglass Streetlight Poles
 - Material Standard No. 5680.0: Ornamental Cast Base and Collar, Aluminum for street light standards
 - Construction Guideline Standard No. D12-11/NSL-40: High Intensity Arterial and Residential Streetlighting – Photoelectric Control
 - Construction Guideline No. SL10-2/NSL-50: Arterial and Residential Street Lighting Installation Details for Anchor Base Aluminum Standard Mast Arm Luminaire with PE Control



DRAFT Seattle Pedestrian Master Plan

Issue Paper: Lighting

November 1, 2008

References

- Auckland City Council (2007). *Plans, policies, reports: pedestrian lighting guide*. Auckland City Council: Auckland, New Zealand. Retrieved 9/15/08 from:
<http://www.aucklandcity.govt.nz/council/documents/lightingguide/introduction.asp>
- City of Chicago (n.d.). *Green alley handbook*. Chicago: Department of Transportation. Retrieved 8/27/08 from:
http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenAlleyHandbook.pdf
- City of Seattle (2008). *City of Seattle standard specifications for road, bridge, and municipal construction*.
- City of Seattle (2008). Design Review Program – *Applicant's Toolbox: Design Guidelines*. Seattle: Department of Planning and Development (DPD). Retrieved 8/14/08 from:
http://www.seattle.gov/dpd/Planning/Design_Review_Program/Applicants_Toolbox/Design_Guidelines/DPDS_009463.asp
- City of Seattle (2005). *Seattle's Comprehensive Plan: Toward a Sustainable Seattle*. Seattle: Department of Planning and Development (DPD). Retrieved 8/14/08 from:
http://www.seattle.gov/DPD/Planning/Seattle_s_Comprehensive_Plan/ComprehensivePlan/default.asp
- City of Seattle, Department of Planning and Development (DPD) (2000). Design Review University Community Design Guidelines. Retrieved 8/15/08 from:
http://www.seattle.gov/dpd/stellent/groups/pan/@pan/@plan/@drp/documents/Web_Informational/cos_005119.pdf
- City of Seattle (SDOT) (2008). *Right-of-way improvements manual*, Chapter 4. Seattle: Department of Transportation. Retrieved 8/14/08 from:
http://www.seattle.gov/transportation/rowmanual/manual/4_16.asp;
http://www.seattle.gov/transportation/rowmanual/manual/4_2.asp
- City of Seattle (2005). *Transportation strategic plan (chapter 3)*. Seattle: Department of Transportation. Retrieved 6/23/08 from:
<http://www.seattle.gov/Transportation/tsphome.htm>
- (IDA) International Dark-Sky Association (n.d). *Approved [lighting] categories*
Retrieved 9/18/08 from:
(<http://www.darksky.org/mc/page.do?sitePageId=56422&orgId=idsa>)
- Seattle City Light (2008). *Streetlight trouble report*.
<http://www.seattle.gov/light/streetlight/>
- Seattle City Light (2005-2008) *Seattle City Light Engineering Standards (2005-2008)*



DRAFT Seattle Pedestrian Master Plan Issue Paper: Lighting November 1, 2008

- Stock Catalog No. 57: Streetlight Equipment for Historical Districts Globe Fixtures
http://www.seattle.gov/Light/engstd/Docs/StkStd/57-11.pdf#xml=http://www.seattle.gov/light/engstd/SCL_EngStd_Results.ASP?cmd=pdfhits&DocId=837&Index=C%3a\Program%20Files\dtSearch\UserData\SCL_EngStdAll&HitCount=10&hits=54+55+a1+a2+ad+ae+105+106+110+111+&hc=38&req=street+lights
- Material Standard No. 5745.0: Fiberglass Streetlight Poles
http://www.seattle.gov/Light/engstd/Docs/ConStd/d1211.pdf#xml=http://www.seattle.gov/light/engstd/SCL_EngStd_Results.ASP?cmd=pdfhits&DocId=18&Index=C%3a\Program%20Files\dtSearch\UserData\SCL_EngStdAll&HitCount=4&hits=118+119+12d+12e+&hc=38&req=street+lights
- Material Standard No. 5680.0: Ornamental Cast Base and Collar, Aluminum for street light standards
http://www.seattle.gov/Light/engstd/Docs/ConStd/d1211.pdf#xml=http://www.seattle.gov/light/engstd/SCL_EngStd_Results.ASP?cmd=pdfhits&DocId=18&Index=C%3a\Program%20Files\dtSearch\UserData\SCL_EngStdAll&HitCount=4&hits=118+119+12d+12e+&hc=38&req=street+lights
- Construction Guideline Standard No. D12-11/NSL-40: High Intensity Arterial and Residential Streetlighting – Photoelectric Control
http://www.seattle.gov/Light/engstd/Docs/ConStd/d1211.pdf#xml=http://www.seattle.gov/light/engstd/SCL_EngStd_Results.ASP?cmd=pdfhits&DocId=18&Index=C%3a\Program%20Files\dtSearch\UserData\SCL_EngStdAll&HitCount=4&hits=118+119+12d+12e+&hc=38&req=street+lights
- Construction Guideline No. SL10-2/NSL-50: Arterial and Residential Street Lighting Installation Details for Anchor Base Aluminum Standard Mast Arm Luminaire with PE Control
http://www.seattle.gov/Light/engstd/Docs/ConStd/d1211.pdf#xml=http://www.seattle.gov/light/engstd/SCL_EngStd_Results.ASP?cmd=pdfhits&DocId=18&Index=C%3a\Program%20Files\dtSearch\UserData\SCL_EngStdAll&HitCount=4&hits=118+119+12d+12e+&hc=38&req=street+lights

Scigliano, E. (2008, June). Give back the night. *Seattle Metropolitan*, 104-108; 120-125.

U.S. Department of Transportation – Federal Highway Administration (2008, April). *Informational report on lighting design for mid-block crosswalks*. Publication No.: FHWA-HRT-08-053. Turner-Fairbank Highway Research Center: McLean, VA. Retrieved from: <http://www.tfhrc.gov/safety/pubs/08053/index.htm>