A P P E N D I X A

Street Lighting Design Guide

Revised January 1, 2026

CITY OF BELLEVUE
WASHINGTON

I. GENERAL

The street lighting system should be a complete, unified design that addresses the various mobility needs within the City of Bellevue. Lighting levels should be appropriate for street function, classification, and pedestrian use. The lighting system should also have a pleasing appearance and complement surrounding features.

It is not practical, economically feasible, nor desirable to complete the illumination system for the entire City at one time. Development and road construction projects are constantly changing city streets. When consistent design criteria are applied to each project, an effective and functional overall lighting system can be established over time.

The City must maintain a consistent style, operational mode, and maintenance program in order to keep the overall lighting system manageable. This Street Lighting Design Guide has been prepared to assist the City, developers, and anyone involved in improvements to accomplish this objective.

II. PROCEDURES

The following is a summary of the procedures for obtaining approval of street lighting designs within the City.

A. Refer to the Transportation Development Review Engineer or assigned Traffic Engineering Reviewer (herein referred to as "Review Engineer") who is assigned to review the proposed project to obtain site specific guidelines. They will provide requirements on if the system is to be City owned (typical) or if it can be allowed on existing PSE infrastructure (requires Review Engineer Approval). The review staff will also provide guidelines on the pole, fixture, and arm based on the location of the project.

B. Submit the following:

   1. Plans
   2. Specifications
   3. AGi32 Calculation File

   Development projects shall submit through the Permit Center or *mybuildingpermit.com*. Capital projects shall submit through the City's project manager.

   Proposed deviations to standard should be discussed and agreed upon with the Review Engineer prior to submittal and documented in a submittal letter. The submittal will be reviewed and comments will be returned to the applicant.

C. Incorporate any review comments and re-submit as noted in Step B above.

D. After the Review Engineer verifies that all comments have been addressed and standards met, the plans and specifications will be approved, and permits issued. All work must be done by a

qualified electrical contractor with experience in outside electrical work. Call for City inspections prior to starting work, as noted on the right-of-way use permit.

E. Call for final Transportation inspection and acceptance. Street lighting is required to be completed prior to issuance of a Temporary Certificate of Occupancy or the Certificate of Occupancy; street lighting cannot be bonded for.

F. When the improvements have been completed, inspected, and accepted, update the plans with all as-built information and provide them to the Review Engineer.

III. SUBMITTAL REQUIREMENTS

A. Plans

The preferred scale is 1" = 20', provided on 24" x 36" sheets.

These plans must show any adjacent existing luminaires, the new luminaires, their stations, installation details, existing and proposed street trees, building awnings, overhangs, details of the service cabinet or connections to existing service cabinet, conduit locations, junction boxes, above and underground utilities including clearance distances, wire notes including a connection to Puget Sound Energy, and any additional information necessary to complete the electrical system.

Final plans must be signed and sealed by a Professional Engineer licensed in the state of Washington.

B. Specifications

The City of Bellevue uses the Standard Specifications for Road, Bridge, and Municipal Construction as published by the Washington State Department of Transportation and modified by the City of Bellevue Special Provisions.

C. Supporting Calculations

Street lighting is to be designed using the illuminance method for calculations prepared with AGi32 software. Digital design files from AGi32 are to be provided to the City, along with line loss calculations for the system.

IV. DESIGN PARAMETERS

Where street frontage improvements are required, new facilities shall be built to the current street light standards. If there is an existing street light system, the portion of system required to meet the photometric design values along the frontage shall be brought into compliance with the current street light standards.

The Review Engineer may approve deviations from the standards and requirements of this design guide based upon meeting sound engineering judgement, maintenance interests, appearance interests, and if it is in the public interest.

A. Poles

Street lighting is required to be installed on City owned facilities. Any new street light pole required shall be a City of Bellevue Steel Roadway Lighting Pole (Standard Drawing SL-100-2) or Aluminum Roadway Lighting Pole (Standard Drawing SL-111-1). Existing City owned poles may be reused if photometric design values can be met and with Review Engineer approval. Existing street lighting on PSE poles may need to be removed and City owned facilities installed.

The Review Engineer may approve a deviation to allow new and existing street lighting to be installed and remain on PSE owned utility poles.

New Steel Roadway Lighting Poles (per Standard Drawing SL-100-2) shall be utilized for Small Wireless Facility (SWF) installations and designed to support a future load of SWF equipment and antennas and a future city sign load as outlined in the Table 1 below:

TABLE 1: SMALL WIRELESS FACILITY EQUIPMENT

Item	Centroid Height	Weight	Wind Load
Pole Top Shroud and Antennas	37’6”	100lbs	218.6lbs
Equipment Cabinet	22’	200lbs	173.1lbs
5G Antennas/Radios	26’6”	87lbs	180.7lbs
Disconnect	20’	30lbs	32.1lbs
Sign	10’	66lbs	450lbs

The total loads at the base of a 35’ tall pole with 12’ luminaire arm cannot exceed the following:

- Bending Moment: 41,816 ft-lb
- Torsion: 2,330 ft-lb
- Shear: 1,814 lb
- Axial Force: 1,798 lb

B. Fixture

Light-Emitting Diode (LED) street lighting fixtures are required for new and retrofit installation. LED temperature color shall be 4000K unless approved otherwise by the Review Engineer. Distribution type shall be Type 2 for streets up to two lanes in width and Type 3 for streets with

3+ lanes. Distribution Type 4 or 5 may be permitted under special circumstances as approved by the Review Engineer. The wattage of the fixture will be recommended by the applicant's engineer based on the street light analysis. In no case shall the system be designed higher than 20% above the minimum average values.

Retrofit installations may require an adapter plate. Contact the Review Engineer for specific type of adapter plate required and include appropriate details in final plans.

Fixture color will typically match color of the pole. Confirm fixture colors with the Review Engineer prior to submittal.

LED fixtures shall include Wattage Label, ANSI 7-wire Photocontrol Receptacle, and Twist Lock Shorting Cap or Photocontrol.

Shield may be required as directed by the Review Engineer.

C. Arm

For new pole installations: See Standard Drawing SL-102-1 or Standard Drawing SL-112-1.

For retrofit installations: The arm length shall be recommended by the applicant's design engineer based on the street light analysis and on maintaining consistency along the public road.

D. Typical Design Parameters

There are several streets and neighborhoods that require special decorative lighting in addition to the standard street lighting systems. Several of these locations are defined in Table 2:

TABLE 2: APPROVED FIXTURES AND USAGE

Location	Design Parameters
Downtown (except Old Bellevue)	Street Scale: New Pole Installation Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED Street Scale: Retrofit Fixture: Leotek Arieta Series LED
Old Bellevue (except Main Street)	Street Scale: New Pole Installation Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED Pedestrian Scale Pole: Round concrete pole Fixture: Cyclone post-top LED
Main Street in Old Bellevue	Pole: Round concrete pole Fixture: Cyclone post-top LED
Major, Collector, Tertiary Arterials Outside Downtown	Street Scale: New Pole Installation: Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED Street Scale: Retrofit Fixture: Leotek GreenCobra Series LED Leotek Arieta Series LED
BelRed Subarea Arterials	See Design Manual Appendix B: The BelRed Corridor Plan
Local Streets	Pole: Roadway Lighting Pole (SL-100-2 or SL-111-1) Fixture: Leotek GreenCobra Series LED Leotek Arieta Series LED
Multi-family, Commercial, Light Industrial, School, or other institutional areas or streets	May be designed to the Tertiary Light Level. Verify with the Review Engineer prior to Design.

The above approved fixtures and usage is for typical cases although there may be site specific deviations. Check with Review Engineer for confirmation prior to design.

E. Midblock Crosswalks

For street light installations at new or existing midblock crosswalks, two streetlights (one on each side of the crosswalk) are required. The preference is for each streetlight to be placed in advance of the crosswalk with respect to the direction of vehicular travel. The Review Engineer may approve a deviation for a single streetlight installation.

F. Temporary Lighting

Temporary lighting shall be installed under the following circumstances:

- Any time a street light is going to be removed for more than 30 days.
- When more than one street light on the same block or within 400-feet of the subject street light (either side of the street) is impacted by construction.
- When the impacted street light is located within 50-feet of a crosswalk or intersection.
- AC power is required for temporary lighting, unless otherwise directed by the Review Engineer.
- As directed by the Review Engineer.

G. Additional Design Parameters

The designer should contact the project owner to verify final building layout and the location of windows that could be affected by the location of the required street light poles and luminaires. Consideration should be given to windows when locating poles and deciding on pole heights to minimize impacts to adjacent buildings. If light poles are proposed near windows, house-side shields should be utilized and reflected in the design calculations.

The design of the street lighting system shall be such that no street trees are placed within 25-feet of a new street light.

For new or retrofit systems, voltage drop must be equal to or less than 5%. Voltage drop greater than 5% will require upgrading the conductors to meet the 5% requirement.

See *Design Manual Appendix C – Fiber Optic Design Requirements* for information on spare conduits and junction boxes that shall be included with all projects requiring frontage improvements.

V. PHOTOMETRIC DESIGN VALUES

A. Lighting Levels

1. Arterial Streets

Bellevue's Transportation Department organizes streets into three classifications for arterial street light levels - Major, Collector, and Tertiary. These classifications are shown on Figure 1 with associated design parameters in Table 3.

For tertiary, Table 3 shows two values for uniformity. Lower uniformity should be provided for completely new city owned systems, whereas retrofit projects (where existing light poles are being utilized) or projects using existing PSE poles (with Review Engineer approval) may be designed to the higher uniformity value.

2. Local Streets

   Streets not classified as Major, Collector, or Tertiary (see Figure 1) are considered local streets. No specific photometric design values have been established for local streets. However, where local streets intersect with arterial streets, local streets shall be considered as Tertiary for the intersection light level analysis. For new plats or newly developed local streets, city-owned systems are preferred and luminaires shall be installed as follows:
   - at intersections
   - at horizontal curves
   - at vertical curves
   - at street ends
   - at marked pedestrian crossings
   - at traffic calming devices
   - and at no greater than 250 foot intervals

3. Sidewalks and Paths

   For sidewalks adjacent to the roadway, whether curbside or separated by a planter strip, no separate calculations are conducted for light levels on the sidewalk area. This is the standard practice, in recognition that the sidewalk will be illuminated by the lighting system installed for the roadway and adjoining properties.

   For Shared-use paths and Multipurpose Paths (MPPs) installed in lieu of or in addition to sidewalks and bike lanes, lighting is typically required with a minimum maintained average light level of 5 lux and a uniformity ratio of 10:1. Verify requirements for MPPs with the Review Engineer prior to starting design.

4. AGi32 Calculation Parameters

   Limits for AGi32 Calculations shall be as follows:
   - Roadway Segment calculations shall include project limits and extend to the adjacent intersections unless approved otherwise by the Review Engineer
   - Intersection calculations shall fully encompass marked crosswalks or shall be to limits of curb returns if there are no marked crosswalks present
   - Marked Midblock Pedestrian Crossing calculations shall fully encompass the width of the marked crosswalk

   A maintenance factor of 0.80 is to be used for all LED systems.

B. PSE Modification

   PSE Modification to design may apply on tertiary or collector arterials that:

   1) Serve a residential area with a significant amount of single family residential driveways, and
   2) Have above-ground electrical distribution on PSE poles that will remain above-ground after the project is complete.

Verify PSE Modification lighting design with the Review Engineer prior to proceeding with the design. For PSE Modification designs, the lighting design is typically limited to the PSE pole locations. Designs should meet the average light levels shown in Table 3 only to the extent practical, as the pole spacing and mounting heights may preclude the ability to reasonably meet minimum average light levels. Uniformity is not considered in PSE Modification designs. In-fill poles (new poles with lights only) are only required when necessary to meet the average light level at a marked midblock pedestrian crossing or an uncontrolled marked crosswalk at an intersection.

TABLE 3: ILLUMINANCE METHOD PHOTOMETRIC DESIGN VALUES

ROADWAY SEGMENTS

CLASSIFICATION	LIGHT LEVEL MINIMUM MAINTAINED AVERAGE VALUES* (LUX)		UNIFORMITY RATIO EAVG/EMIN
	ASPHALT CONCRETE	PORTLAND CEMENT CONCRETE	
MAJOR	13	9	4
COLLECTOR	9	6	4
TERTIARY	5	4	4 (New Systems) 6 (Retrofits)

INTERSECTIONS

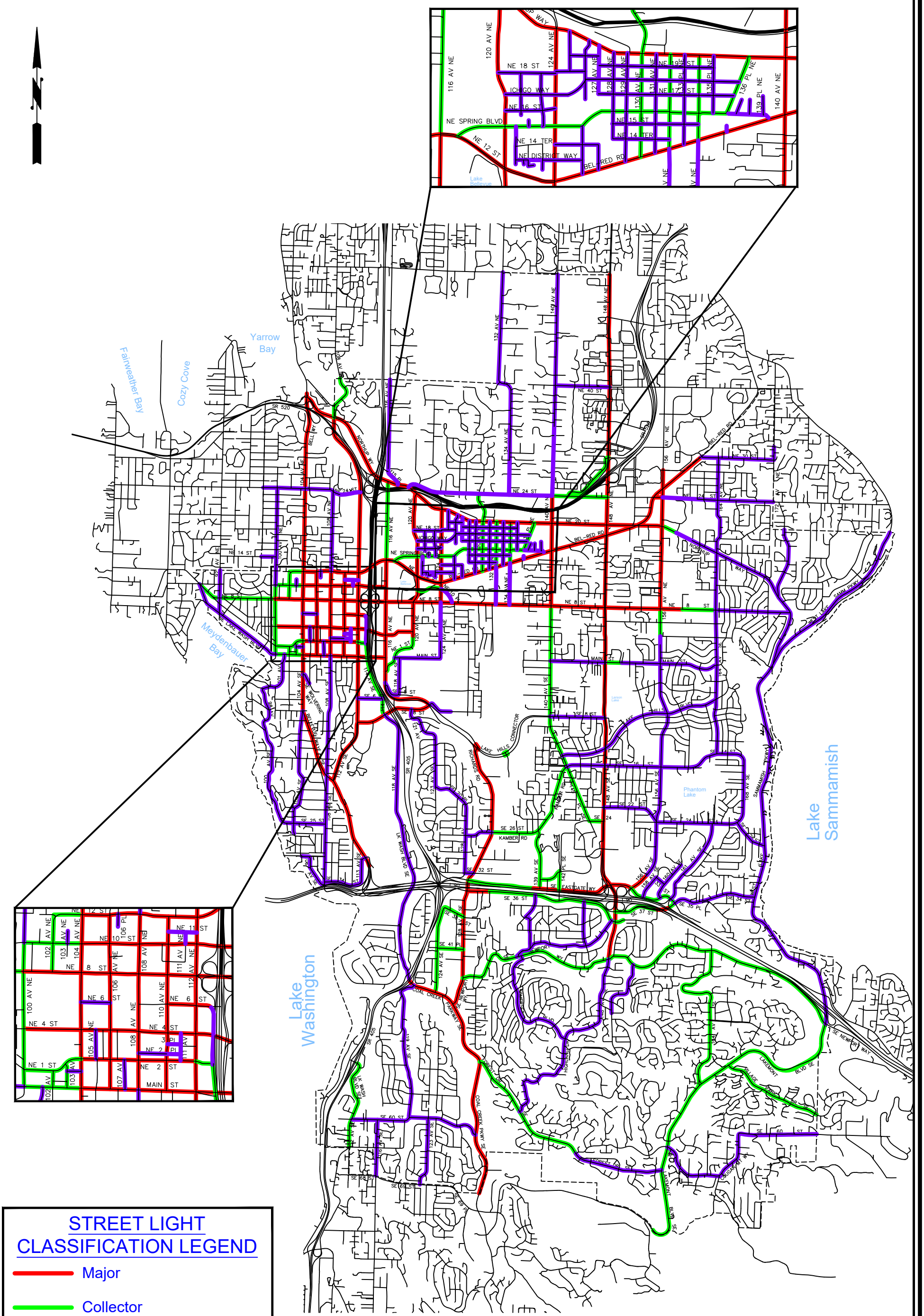
CLASSIFICATION	LIGHT LEVEL MINIMUM MAINTAINED AVERAGE VALUES* (LUX)		UNIFORMITY RATIO EAVG/EMIN
	ASPHALT CONCRETE	PORTLAND CEMENT CONCRETE	
MAJOR – MAJOR	26	18	4
MAJOR – COLLECTOR	22	15	4
MAJOR – TERTIARY	18	13	4
COLLECTOR – COLLECTOR	18	12	4
COLLECTOR – TERTIARY	14	10	4
TERTIARY - TERTIARY	10	8	4 (New Systems) 6 (Retrofits)

MARKED MIDBLOCK PEDESTRIAN CROSSING**

CLASSIFICATION	LIGHT LEVEL MINIMUM MAINTAINED AVERAGE VALUES* (LUX)		UNIFORMITY RATIO EAVG/EMIN
	ASPHALT CONCRETE	PORTLAND CEMENT CONCRETE	
MAJOR	26	18	N/A
COLLECTOR	18	12	N/A
TERTIARY	10	8	N/A

* Systems should be designed no higher than 20% above minimum average values

**Includes uncontrolled marked crosswalks at intersections


STREET LIGHT
CLASSIFICATION LEGEND
Major
Collector
Tertiary
Yarrow Bay
Fairweather Bay
Cozy Cove
Meydenbauer Bay
Lake Washington
Lake Sammamish
Phantom Lake
Larson Lake
Lake Bellevue
NE 18 ST
ICHIGO WAY
NE 16 ST
NE SPRING BLVD
NE 15 ST
NE 14 TER
NE 12 ST
NE DISTRICT WAY
BEL-RED RD
NE 24 ST
NE 20 ST
NE 8 ST
MAIN ST
SE 8 ST
SE 16 ST
SE 22 ST
SE 24
SE 26 ST
KAMBER RD
SE 32 ST
SE 36 ST
SE 37 ST
SE 41 PL
SE 60 ST
SE 68 ST
SE 69 PL
EASTGATE WY
NORTHUP WY
LAKE HILLS CONNECTOR
RICHARDS RD
COAL CREEK PKWY SE
LK WASH BLVD SE
LAKEMONT BLVD SE
SAMMAMISH PKWY
SR 520
SR 405
120 AV NE
124 AV NE
116 AV NE
132 AV NE
140 AV NE
148 AV NE
156 AV NE
164 AV NE
112 AV SE
118 AV SE
124 AV SE
132 AV SE
140 AV SE
148 AV SE
156 AV SE
164 AV SE
City of Bellevue
FIGURE 1
STREET LIGHT LEVEL MAP
REVISION DATE 10/25
DEPARTMENT TRANS