Audubon Society of Portland
5151 NW Cornell Road
Portland OR 97210

Planning and Sustainability Commission
1900 SW Fourth Ave., Suite 7100, Portland OR, 97201
Attn: CC2035 testimony

August 9, 2016

Dear Planning and Sustainability Commission,

Please accept these comments in support of bird-safe building design, and exterior lighting standards in the draft Central City 2035 Plan. These comments supplement additional comments submitted by Bob Sallinger on behalf of Audubon. We appreciate the opportunity to participate in this process.

Exterior Lighting Standards (33.510.253.E.5.h):

We support the proposed new lighting standards in both intent and content, and we applaud the city's leadership in taking this step forward *"to minimize the adverse health, safety, and livability impacts of exterior lighting on humans, fish and wildlife, including glare, light spill, and encroachment into habitat areas."* However, we recommend that the general principles in this lighting standard be applied beyond the Greenway Overlay Zone and the River General overlay zone.

Best practices should be applied more broadly, both throughout the Central City and city-wide to improve lighting and energy efficiency, reduce light pollution, and minimize unintended impacts on human health as well as fish, wildlife and plants. These best practices that should apply city-wide—which are partially addressed in *Section 2: General standards*, and *Section 3: Additional Standards for areas near the Willamette River*—include the following:

(2) General standards:

- Exterior lights must not project light upward or to the side of the fixture; and
- The top and sides of all exterior light fixtures must be shielded with 100 percent opaque materials; and

(3) Additional standards for areas near the Willamette River:

- Lamps must fall below 3,000K or within an S/P ratio range of 1- 1.2

Additional best practices in Lighting Design which should be included in Exterior Lighting Standards city-wide include:

- All lighting is aimed down: no light should be cast above 90°; and
- Unnecessary architectural lighting is minimized; and
- Blue-rich White Light should be prohibited in exterior applications; and
- Lighting S/P ratio should fall between 1.0 (near sensitive habitat) and 1.2 (in urban areas); and
- A lighting ordinance should be developed in Portland to limit total lumen output; may align with the International Dark-sky Association/Illuminating Engineering Society Model Light Ordinance of 2010 or the most recent available volume of the MLO

We recommend establishing lighting standards citywide that meet Portland's new Comprehensive Plan policies calling for efficient lighting that reduces light pollution and impacts on wildlife. We also support standards that apply in the river setback including prohibitions on shining light into the river and setting limits on both brightness and spectrum. We also recommend that the City add a policy and/or action to work with partners (e.g., Audubon, local building owners and managers) to support a Lights Out program in the Central City.

These recommendations are based on a large body of research demonstrating that the propagation of artificial light at night has negative impacts on humans, fish, wildlife and plants. Biological systems evolved in cycle of dark night and bright daylight. Unshielded light at night generates light pollution which alters this night/day cycle, obscures stars, disorients night-migrating birds, wastes energy, diminishes our cultural and historical heritage, and has deleterious impacts on humans, fish and wildlife. Today, the rapid development of high-efficiency LEDs has led to conversion projects around the globe aimed at reducing carbon emissions, reducing long-term lighting maintenance costs, and saving energy. However, a growing body of research is revealing the unintended and deleterious impacts of blue-rich white light-emitted by some LEDs. On June 14th, the American Medical Association (AMA) released a unanimously approved statement about LED lighting, recommending the selection of fully-shielded, dimmable lamps that minimize blue-light emission. The AMA statement cites concerns including visual discomfort and retinal damage, melatonin suppression, sleep disruption, disruption of circadian rhythms, impaired daytime functioning, and obesity. Given the widespread conversion of lighting systems to LED, best practices in lighting design and lamp selection need to be adopted city-wide, and should apply to all exterior lighting, including city streetlights.

Bird-safe Exterior Glazing (33.510.223)

We support establishment of the new Bird-safe Exterior Glazing standards, which follow City Council's direction set forth in Resolution #37034 (adopted 2013), and will help meet new Comprehensive Plan Policies calling for bird and wildlife-friendly building design and reduced hazards to wildlife. The Bird-Safe Glazing standards are also generally consistent with the City's recently updated Green Building Policy (April 2015).

Such standards are necessary in the Central City given its proximity to the river and the extensive glazing of its buildings. They are also needed in light of proposed requirements to increase exterior glazing in order to support active ground floor uses. As written, the bird-safe standards provide an allowance for 10% of the glazed area to remain untreated, and offer a menu of glazing treatment options to facilitate compatibility between goals for active ground floor uses and reducing risk of bird collisions. There are a number of treatment options that create as little as 6.25% pattern density, which allows for a considerable preservation of transparency while also reducing the risk of window collisions.

It is estimated that up to 1 billion birds die annually in the US as a result of a window collision, making window collisions among the top three sources of mortality for birds. Over thirty years of research indicates that birds do not recognize glass as a barrier, and are therefore vulnerable to collisions with the transparent and reflective glass that is ubiquitous in the built environment. Highest risk areas are within the first 40-60 feet above ground and adjacent to ecoroof areas. From 2009-2011, Audubon Society of Portland conducted surveys of bird mortality due to collisions with buildings, many of which are in the Central City planning area. We recorded collision-caused deaths for numerous bird species, especially neotropical migratory songbirds.

We recommend that the proposed standards be applied more broadly than areas shown on map 510-22. Much of the Central City outside the mapped area has sufficient street tree canopy to create risk, due to reflections in the windows of ground and lower floors. In addition, the intent to increase tree canopy goals in Portland warrants establishing additional precautions for bird safety. We support bird-safe glazing standards not applying to industrial zoning where there is reduced collision risk due to relatively limited glazing and limited tree canopy and vegetation. However, the standard should be expanded to apply to areas that carry Employment Opportunity Subarea Zoning, including the Central Eastside where we expect new development, infrastructure improvement, and development of the Green Loop to result in an overall increase in tree canopy density and in an increase in glazing, the combination of which will amplify window collision risk.

In the interest of clear and objective standards, we recommend the following edits to Bird-safe exterior glazing standards proposed on page 143:

- Options a. and d. should be clearly identified as applying specifically to markers on glass and window film glazing applications (Visible marking pattern may be created by fritting, etching, permanent stencil/ frosting, or window film);
- Option d. should indicate that circular or squared marking elements should be spaced every 2 inches for horizontally lined-up elements and every 4 inches for vertically lined-up elements;
- Option b. should be deleted in the interest of simplicity and clarity of meeting contrast sensitivity requirements to reduce collision risk for birds;
- Option c. should be clearly identified as applying specifically to exterior screens and/or netting;
- Addition of an option specifying that for louvers and grilles, horizontal or vertical slats shall have a 1/8" minimum face thickness. Slat depth and spacing ratio shall obscure 85% of glass when analyzed from all possible viewing angles

- Addition of an option specifying UV-patterned glazing with pattern on #2 surface;
- Addition of an option allowing for any glazing product or treatment that carries a Material Threat Factor Score below 30 from American Bird Conservancy, and is therefore suitable for meeting the USGBC LEED Pilot Credit 55: *Bird Collision Deterrence* as well as meeting requirements of local ordinances established in San Francisco, Toronto, Highland Park, Oakland, and the State of Minnesota's B3 Guidelines.

Revised standards would read like this:

C. Bird-safe exterior glazing standards.

1. At least 90 percent of windows on the ground floor and the next 3 floors, windows on floors located directly adjacent to an ecoroof, roof garden, or other vegetated or landscaped roof, the glazed portions of balcony railings, sky bridges, atria, and glass walls must have a visible pattern on the outermost surface of the glazing such that:

a. For markers on glass and window film glazing applications:

--Visible markers at least 1/8-inch-wide, with a maximum spacing of 4 inches for vertical elements, or a maximum spacing of 2 inches for horizontal element (pattern may be created by fritting, etching, permanent stencil/ frosting, or window film);

--Circular or square markers at least 1/4 inch in diameter, spaced every 2 inches for horizontally lined-up elements and every 4 inches for vertically lined-up elements.

b. For exterior screens and/or netting:

--Spacing no more than 1/4 inch in any direction where visible markers are less than 1/8 inch wide;

c. For louvers, grilles, and mullions on the exterior of the façade:

--Horizontal or vertical slats with 1/8" minimum face thickness. Slat depth and spacing ratio shall obscure 85% of glass when analyzed from all possible viewing angles

d. for UV-pattern in glazing;

--1/16" UV reflective lines arranged in an irregular "webbed" pattern with 2" maximum spacing on interior (#2) surface

e. Any other glazing product or treatment that carries a Material Threat Factor Score below 30 from American Bird Conservancy, and is therefore suitable for meeting the USGBC LEED Pilot Credit 55: *Bird Collision Deterrence* as well as meeting requirements of local ordinances established in San Francisco, Toronto, Highland Park, Oakland, and the State of Minnesota's B3 Guidelines.

The proposed bird-safe glazing treatment specifications for glass and window film markers can be provided by vendors to project designers/applicants upon request, to facilitate efficient implementation by BDS staff. The louver, grille and/or mullion modeling can be provided by the architect and/or product vendor. A specification sheet should be required as part of the applicant's permit requirement.

Additionally, we recommend the inclusion of a general prohibition on mirrored and highly reflective glass in the Central City 2035 plan in order to reduce the high risk of bird collisions associated with this glazing material, and additionally to reduce unnecessary glare and excessive heat reflection.

Thank you for your consideration of these comments.

Mary Coolidge
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Audubon Society of Portland