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Planning Commission Work Session Agenda

Monday, March 24, 2025 – 5:30pm

Community Development Office, 741 Main Street, Perry

1. Call to Order
2. Roll Call
3. Citizens with Input
4. Capital Improvement Projects Update
5. Old Business – Finalize comments on design standards and related amendments
6. New Business – None
7. Other Business -
   - Review upcoming items for April 7, 2025, informational/public hearings
   - Update on latest City Council zoning decisions
8. Adjournment

All meetings of the Planning Commission are open to the public.
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Perry

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Memorandum

To: Planning Commission
From: Bryan Wood, Community Development Director
Date: March 17, 2025
Re: Design Standards, Setbacks, and Exterior Lighting

Please review the attached documents:

1. Revised Non-Residential Design Standards – Updated based on discussion at February Work Session. Updates are highlighted.
2. Proposed Multi-Family Residential Design Standards – Unchanged
3. Setbacks – Revised to clarify minimum and maximum setbacks from streets. Updates highlighted.
4. Exterior Lighting – Two documents are provided – the Model Lighting Ordinance and proposed revision to Sec. 6-5. After reviewing the Model Lighting Ordinance, I believe it will require more complex review and community involvement than I can provide in my remaining tenure. I have proposed modifications (highlighted) to the originally proposed standards I suggest as an interim improvement to the LMO until more detailed review of light standards can be completed.

Delete Section 6-6 in its entirety and replace as follows:

Sec. 6-6.1. *Design standards for nonresidential development.*

(A) *Purpose and intent.* These standards are designed to promote and enhance the quality and character of the built environment in the city. More specifically, the purposes of this subsection are to:

(1) Encourage high quality development as a strategy for investing in the city's future;

(2) Ensure development remains compatible with its context;

(3) Maintain and enhance the quality of life for the city's citizens;

(4) Shape the city's appearance, aesthetic quality, and spatial form;

(5) Promote compatibility between nonresidential development and adjacent residential uses;

(6) Provide property owners, developers, architects, builders, business owners, and others with a clear and equitable set of parameters for developing land;

(7) Encourage a pedestrian- and bicyclist-friendly environment;

(8) Ensure greater public safety, convenience, and accessibility through the physical design and location of land-use activities.

(B) *Applicability.*

(1) These standards shall apply to new construction, renovation, or reconstruction of existing structures that exceeds 25 percent of the current fair market value of the structure. The fair market value shall be based on a market appraisal performed by a certified appraiser at the applicant's expense or assessed value determined by the appropriate county tax assessor. This shall not be construed to require demolition of an existing structure in order to comply with these standards. In such cases, the administrator may grant a waiver of the requirements if presented with a certification by a registered architect or engineer that compliance is not practicable on an existing building. These standards shall not apply to routine maintenance and repair of a structure or other features on the surrounding site.

(2) In the event of conflict between these design standards or other standards in this chapter, the more stringent or restrictive standard shall apply.

(C) *Exceptions.* The standards of this section shall not apply to developments in the following areas or to the following uses:

(1) M-2, General Industrial district;

(2) M-1, Wholesale and Light Industrial District;

(3) GU, Government Use District, although the standards should be considered;

(4) DD, Downtown Development Overlay District (see Sec. 6-6.3 for standards applying to DD), where the adopted design standards and design guidelines are more stringent than the requirements of this section;

(5) HP, Historic Preservation Overlay District, where the adopted design standards and design guidelines are more stringent than the requirements of this section;

(6) PUD, planned unit development district, where the adopted regulating plan and design standards are more stringent than the requirements of this section;

(7) Form-Based Code Districts (see Appendix A), where the adopted design standards are more stringent than the requirements of this section;

(8) Utilities.

(D) *Timing of review.* Compliance with the standards in this subsection shall be determined as part of the review for a site plan permit and building permit, as appropriate.

(E) *Nonresidential design standards.*

(1) *Orientation.*

(a) Buildings shall be configured in a manner that enhances pedestrian activity, regardless of the location of the main entrance or building setbacks through any of the following features:

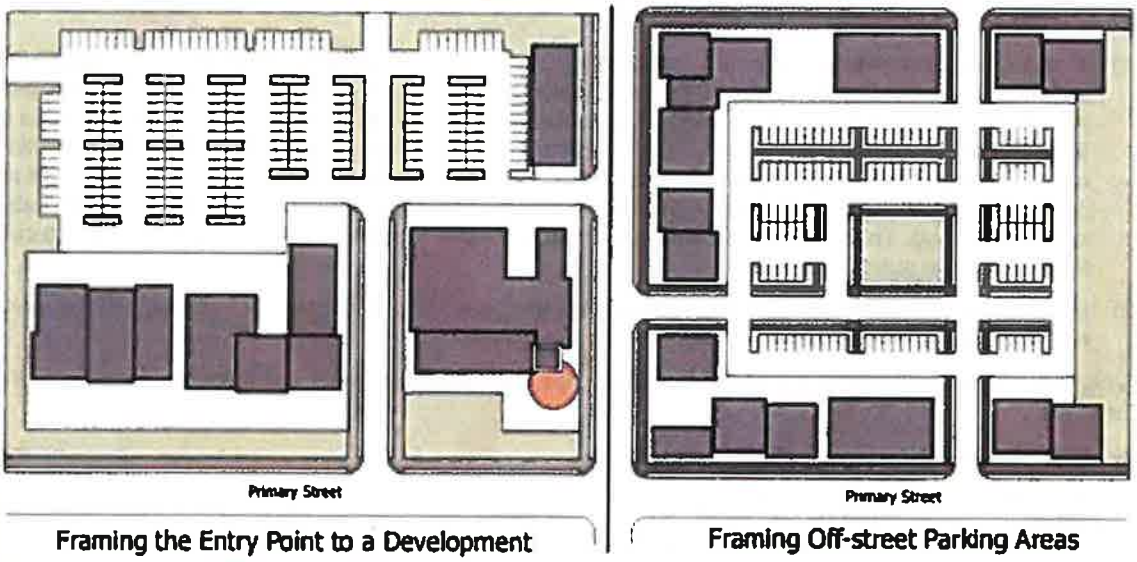
- Orientation of the building towards adjacent streets, sidewalks, or open spaces;
- The inclusion of storefront windows and awnings;
- Avoidance of monolithic, un-broken facade wall planes;
- Pedestrian-oriented entrances; and
- Similar features that foster an active public realm.

(b) Nonresidential and mixed-use development shall be configured in a manner that creates and enhances access to existing and planned transit features or bicycle/pedestrian trail.

(c) Multiple building developments shall be oriented in at least one of the following formats (see Figure 6-6-1):

- Buildings facing each other across a relatively narrow vehicular access area with pedestrian amenities in a "main street" character;
- Buildings framing and enclosing at least three sides of parking areas, public spaces, or other site amenities; or
- Buildings framing and enclosing outdoor dining or gathering spaces for pedestrians between buildings.

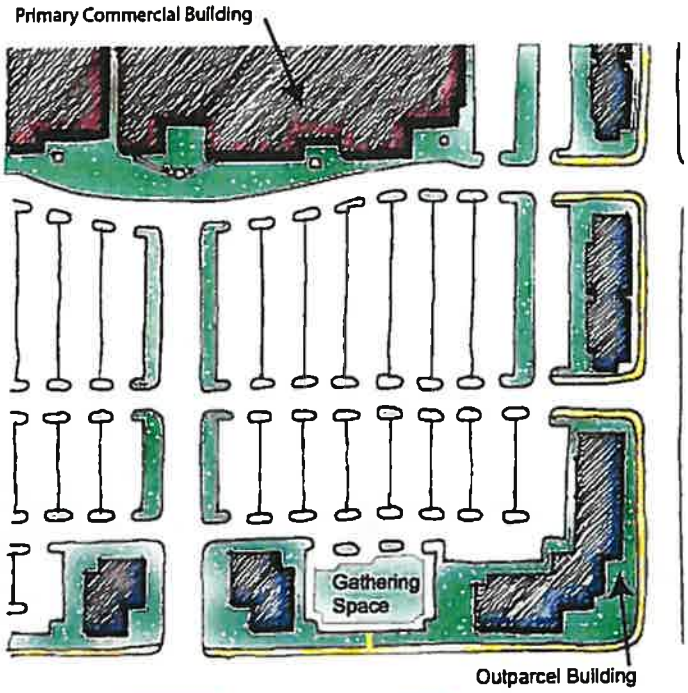
Figure 6-6-1: Examples of the orientation of multiple building developments



(d) Outparcels.

- To the maximum extent practicable. outparcels and their buildings shall be situated in order to define street edges, entry points, and spaces for gathering or seating between buildings (see Figure 6-6-2).
- Spaces between buildings on outparcels should be configured with small scale pedestrian amenities such as plazas, seating areas, pedestrian connections, and gathering spaces.
- Outparcels may be used to comply with the required orientation of multiple building developments.

Figure 6-6-2: Orientation of outparcel buildings



(e) Nonresidential buildings shall not exceed twice the height of an adjacent single-family detached dwelling or shall be stepped back from the lot line such that the lowest portion of the building is the portion closest to the single-family detached dwelling.

(2) *Entrances.*

(a) Public/customer entrances shall incorporate the following features:

- Overhangs, awnings, canopies, or other projections of at least five feet from the building wall;
- Exterior lighting to illuminate the entryway during hours of operation after sundown; and
- Windows within or beside entry doors that allow entrants to see into the building.

(b) Front entrances shall be provided that face the street from which the building derives its street address with exception allowed for multiple building development. Nothing in these standards shall prevent a secondary entrance from facing a parking lot or open space. Buildings on corner lots may incorporate an entrance on the corner.

(c) Adjacent to single-family detached dwellings, front entrances shall not:

- Face an adjacent single-family detached dwelling, excluding across the street.
- Include gathering or patron waiting areas outside the building that face residential dwellings.
- Include speakers or other devices that produce music or other noise that is audible beyond a lot line abutting a detached single-family dwelling.

(d) For buildings over 10,000 square feet in gross floor area, public/customer entrances shall be clearly defined and incorporate at least two of the following features and entrances for retail sales and service uses over 30,000 gross square feet shall incorporate three of the following features:

- Covered roof projections of at least 60 inches in depth that emphasize the primary entrance location;
- Distinctive roof forms, towers, gables, roof ridges, peaks, or other features that differ in height by three feet or more from the balance of the roof;
- Window walls of uninterrupted glass with a minimum height of 10 feet and a minimum width of 30 feet adjacent to the entryway doors;

- Covered or shaded pedestrian courts, patios, or plazas of at least 100 square feet adjacent to the entrance;
- Fountains, pools, or other water features;
- Canopy trees planted no greater than 40 feet on-center along the front facade wall; or
- Public art.

(3) *Building facades.*

(a) Blank monolithic walls with little or no architectural detail or items that add visual interest shall be prohibited from facing public streets or residential dwellings.

(b) Buildings shall include awnings, canopies, arcades, or overhangs with a minimum projection of four feet from the building wall adjacent to a public sidewalk for weather protection (see Figure 6-6-3).

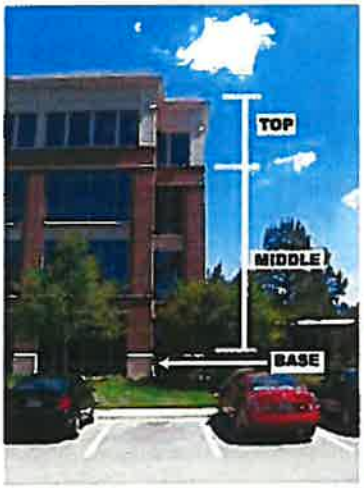
Figure 6-6-3: Awnings along a public sidewalk

(c) Buildings of 10,000 square feet in gross floor area or less shall incorporate two or more of the following features on all facades visible from public streets, parking areas, and residential dwellings. Buildings of more than 10,000 gross square feet shall incorporate three or more of the following features on similar facades:

- Recessed or display windows;
- Offset surfaces, niches, insets, projections, or bas relief with a minimum depth of four inches;
- Window indentations that incorporate a differing building material, texture, or color, along with an awning or overhang;
- Differentiated piers, columns, or pilasters;
- Textured materials;
- Roofline changes, coupled with correspondingly aligned wall offset or facade material changes, changes in the roof planes, or changes in the height of a parapet wall: or
- Changes in wall plane (such as projections or recesses) with an offset or depth of at least one foot and a width of at least ten feet, located a minimum of every 60 feet.
- Foundation landscaping with plant material appropriately scaled to the building mass.

(d) Buildings of two or more stories should be configured to include a discernible base, middle, and top (see Figure 6-6-4).

Figure 6-6-4: Base, middle, and top



(e) Single story commercial retail and service buildings over 20 feet in height shall be designed with pedestrian-scaled articulation to mitigate the perception of height.

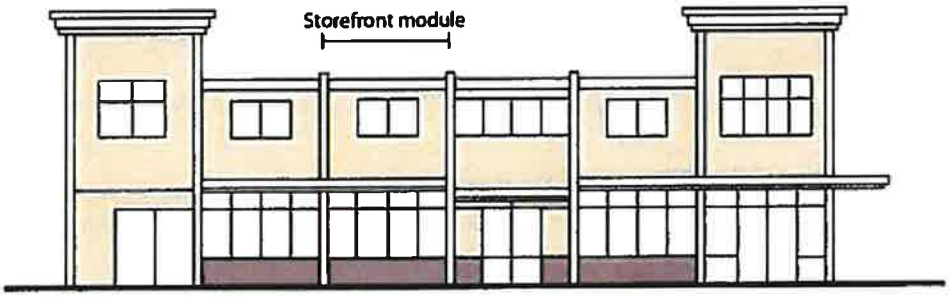
(f) Side and rear building facades, if visible from public streets, shall have a similar architectural treatment as used on the primary or front facade. Facades facing a rear service alley are exempt from this requirement.

(g) Prototypical or franchise designs shall be adapted to reflect the design standards of this subsection, the applicable base and overlay district standards, and the character of the city.

(h) Commercial retail and service buildings shall include pedestrian walkways of at least five feet in width along the entire front building facade. All or a portion of this requirement may be located in a public right-of-way, subject to approval of the right-of-way owner.

(i) Commercial retail and service front building facades of 50 feet or more in width shall be configured as a series of individual ground-floor storefronts, discrete building modules, wings, recesses, or projections from the primary facade wall (see Figure 6-6-5).

Figure 6-6-5: Example configuration of a retail building facade



(j) Outbuildings located in front of other buildings within the same development shall include a consistent level of architectural detail on all four sides of the building as well as exterior materials and colors that are compatible with the primary building in the development.

(4) *Roof form.*

(a) Overhanging eaves and roof rakes on gable ends shall extend at least 12 inches past the supporting walls.

(b) Flat roofs shall incorporate parapet walls with cornice treatments designed to conceal the roof and roof-mounted mechanical equipment. All parapet walls visible from a public street shall be finished.

(c) A parapet wall shall be the same or similar in color and material to the building and shall not exceed 25 percent of the height of the supporting wall.

(d) Except for cupolas and steeples, sloped roofs shall include two or more sloping roof planes with greater than or equal to one foot of vertical rise for every three feet of horizontal run (1:3) and less than or equal to one foot of vertical rise for every one foot of horizontal run (1:1).

(e) All roof vents, pipes, antennae and other roof penetrations should be of a color that will minimize their visual impact unless concealed by a parapet, located on the rear elevation, or configured to have a minimal visual impact as seen from the street or existing residential development.

(f) Within developments with multiple buildings, building heights shall be varied to avoid the appearance of an elongated building mass. This can be achieved by stair-stepping building heights or by varying roof forms.

(g) Green roofs, which use vegetation to improve stormwater quality and reduce runoff, are permitted as an alternative to the roof forms described in this subsection.

(h) Buildings of more than 10,000 gross square feet:

- Shall include a variety of different roof forms or roof line changes. Roof line changes shall include changes in roof planes or changes in the top of a parapet wall.
- When roof line changes are included on a facade that incorporates wall offsets or material or color changes, roof line changes shall be vertically aligned with the corresponding wall offset or material or color changes.
- Parapet walls shall include a cornice or other form of cap appropriate to the architecture of the building.

(5) *Transparency.*

(a) Windows and doors shall be architecturally related to the style, materials, and details of the building they serve.

(b) Nonresidential buildings open to the public shall provide visual transparency into interior spaces at entrances and along the street-facing facades in the form of clear glass windows, doors, or storefront systems (see Figure 6-6-6).

- In buildings with ground floor ~~commercial~~ eating establishments, retail sales and service uses, street-facing facades and facades adjacent to a public sidewalk or pedestrian pathways shall have at least 60 percent transparency between two feet and eight feet above grade. Provided, however, that individual tenant spaces exceeding 40,000 square feet in area and located behind buildings oriented to the street(s) shall have at least 20 percent transparency between two feet and eight feet above grade and at least 30 percent transparency achieved through the use of clerestory windows. Percentages are calculated based on length of each facade.
- Windows on the ground floor of side facades may consist of clear, frosted, or spandrel glass, and may be organized into a display window configuration.
- Windows or doors shall be positioned to avoid direct views into the windows of an existing adjacent residential dwelling.
- Clerestory windows are encouraged on all facades.
- Reflective or heavily tinted glass that obstructs views into the building shall not count towards transparency requirements.

Figure 6-6-6: Facade transparency (windows) along a street facade

(6) *Materials.*

(a) All facades of a building visible from a public street or residential district shall present consistent materials and architectural style.

(b) Accessory buildings and structures shall be similar in materials and architectural style to the primary building.

(c) Where two or more materials are proposed to be combined on a facade, the heavier and more massive elements shall be located below the lighter elements (e.g., brick shall be located below stucco). Use of a heavier material as a detail on the corner of a building or along cornices or windows is acceptable (see Figure 6-6-7).

Figure 6-6-7: Example of multiple building materials

(d) Primary facade materials shall not change at outside corners and shall continue around the corner to a logical point of conclusion such as a window or change in facade plane.

(e) Material changes shall occur along a horizontal line or where two forms meet. It is acceptable, however, that change of materials occur as accents around windows, doors, cornices, or as a repetitive pattern.

(f) Brick shall be the primary material (at least 50 percent of the façade excluding windows and doors) on all facades visible from a public street. The following materials shall not be used:

- Corrugated metal siding, however, high quality architectural metal siding may be used;
- Exposed smooth-finished concrete block;

- Styrofoam-backed and synthetic stucco within 12 feet of the grade level and within two feet of any exterior door jamb (reinforced Styrofoam-backed stucco is acceptable);
- Vinyl siding;
- Lap siding on the ground floor; or
- Split-faced concrete masonry units exceeding 15 percent of front facades or facades facing public streets.

(g) Field colors used on the main body of a building shall be subdued and of low reflectivity; fluorescent and metallic paints are prohibited. However, nothing in this section shall prohibit the use of reflective colors on building roofs.

(h) Building materials shall either be similar to the materials already being used in the immediate area, or if dissimilar materials are being proposed, other characteristics such as scale and proportions, form, architectural detailing, color, and texture shall be utilized to ensure that enough similarity exists for the building to be compatible despite the differences in materials.

(i) Where nonresidential buildings are adjacent to single-family detached dwellings, primary exterior building materials shall be similar in composition and arrangement to that used on surrounding single-family detached dwellings (see Figure 6-5-8).

Figure 6-5-8: Similar building materials to adjacent single-family dwellings

(7) *Drive-through.*

(a) If covered, the roof over a drive-through shall have the same architectural design and materials as the primary portion of the structure.

(b) A drive-through ordering station and pay/pick-up windows shall not be located in front of a building or on the same building facade as the primary entrance.

(c) A drive-through lane shall be located so as not to compromise the quality of the pedestrian experience at any public street edge.

(d) Pedestrian pathways that cross queuing or stacking lanes shall be ~~raised and~~ made prominent to ensure pedestrian visibility and safety.

(e) In no instance shall a drive-through face residential dwellings.

(f) Speakers shall be directed away from adjacent residential dwellings and shall not be audible beyond shared lot lines.

(8) *Service areas.*

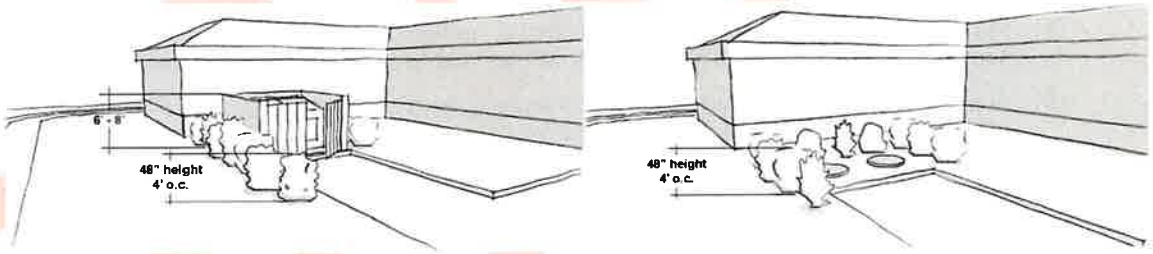
(a) Refuse collection and service areas shall be fully screened from view from public streets or off-site public open space areas. These areas shall be integrated into the principal building architecture to the maximum extent practicable (see Figure 6-6-9).

Figure 6-5-9: Screening elements integrated with the building

(b) Above-ground refuse containers shall comply with the below standards (see Figure 6-6-10):

1. Above-ground refuse containers shall comply with the applicable setback requirements. No above-ground refuse container shall be located less than 15 feet from the property line of any abutting property improved with a single-family detached use.
2. Above-ground refuse containers shall be fully screened from the view of adjoining property and public streets. Above-ground refuse containers shall be screened in compliance with section 6-3.7. In-ground refuse containers shall be screened with evergreen plantings.

Figure 6-6-10: Example of refuse container screening



3. Times of service. Deliveries, waste collection, and similar commercial activities are prohibited between the hours of 10:00 p.m. and 6:00 a.m.

(c) Utility boxes and meters should not be located in front of street-facing facades.

(d) Loading, service, and equipment areas that are associated with an outparcel building shall be screened through the use of structural elements and similar materials attached to and integrated with the building.

(e) Automated teller machines (ATM's) shall use materials that reflect the architecture of the surrounding buildings and neighborhood. Walk-up ATM's shall be oriented to pedestrian walkways.

(f) Vending machines, ATM's, service areas, mechanical equipment, loading areas, and similar functional elements shall be located away from residential districts, or shall be configured in a manner that prevents any negative impacts (visual, auditory, or otherwise).

(9) *Outdoor storage.*

(a) Areas for outdoor storage are permitted to the side or rear of the principal building, no closer than 20 feet to any public right-of-way, sidewalk, or internal pedestrian way unless screened by a wall or fence with gate(s).

(b) Areas for outdoor storage shall be fully screened from off-site view.

(c) Outdoor display of goods for sale may be permitted in areas immediately adjacent to the entrance(s). Outdoor display areas shall be located within 20 feet of the building facade wall and within 40 feet of a building entrance. In no instance shall an outdoor display obstruct pedestrian circulation or interfere with ingress to or egress from the building entrance (see Figure 6-6-11).

Figure 6-6-11: Outdoor display of goods at store entrance

(10) *Outdoor dining.* Outdoor dining or other outdoor activities that generate noise, as defined by noise standards, chapter 17, article III, section 55 of the City Code, or excessive lighting, as defined by lighting standards, section 6.5, shall not be located on any building side that abuts a single-family detached use. Any such outdoor dining or activity areas shall be positioned in such a manner that the building shall shield the dining or other outdoor activity from such residential use.

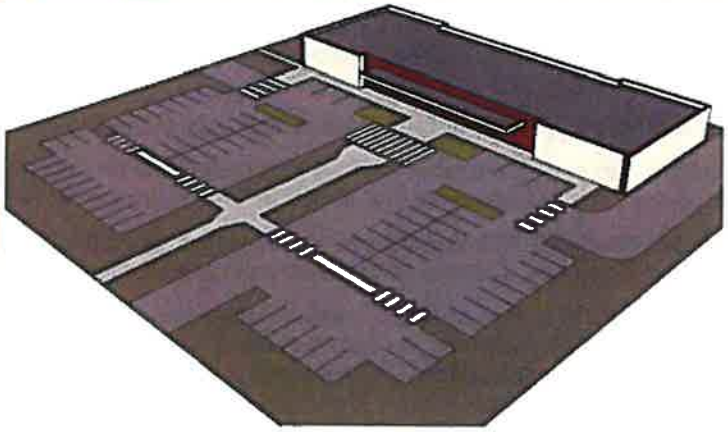
(11) *Stormwater facilities.* Unless designed as a wet pond amenity, stormwater facilities shall be located behind building(s) or located underground.

(12) *Parking lot location.*

(a) Parking areas shall be located and designed to reduce or eliminate visual or operational impacts to surrounding properties and shall comply with all relevant off-street parking and landscaping requirements.

(b) Surface parking lots containing ~~40~~ 100 or more spaces shall be divided into discrete areas (pods) not exceeding ~~30~~ 50 parking spaces. An internal path or sidewalk located within landscaped areas between, and connecting, the parking pods is required where there are more than ~~three~~ five pods, or the configuration of the pods makes it difficult for pedestrians to access the building (see Figure 6-6-12).

Figure 6-6-12: Large surface parking lot configuration with internal pathways

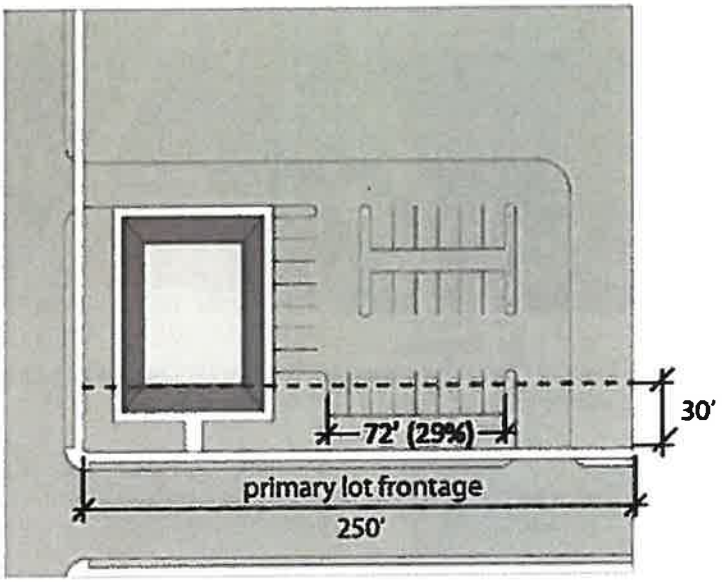


(c) The drive aisle in front of the primary entrance(s) of a building shall include a pedestrian crossing area ~~that is at least 20 feet wide and includes a raised surface above the surrounding asphalt and a differing surface material or painting to indicate it as a pedestrian crossing area~~ that is clearly marked by using a different material and color than the drive aisle.

(d) No more than 20 percent of the total parking spaces (up to a maximum of 100 spaces) designed as a single-loaded parking aisle may be located in the front yard adjacent to the primary street. If more than one street abuts the property, the designation of the primary street shall be determined by the administrator.

(e) No more than 50 percent (length) of the first 30 feet (depth) of the primary lot frontage may be occupied by off-street surface parking spaces. The primary lot frontage is the portion of a lot that abuts the street from which the lot derives its street address (see Figure 6-6-13).

Figure 6-6-13: Parking spaces may occupy up to 50 percent of the primary lot frontage



(f) Off-street parking shall be located away from lot lines shared with detached single-family dwellings, to the maximum extent practicable.

(g) Parking structures, when provided, shall include the following:

- Clear sight lines of abutting streets, driveways, and pedestrian pathways;
- Light-colored interior walls and ceilings;
- Adequate and uniform interior lighting without glare to surrounding properties.

(13) *Circulation.*

(a) Clearly defined, safe, pedestrian access shall be provided from parking areas and adjacent public sidewalks to building entrances.

(b) All internal pedestrian walkways shall be distinguished from driving surfaces through the use of durable low-maintenance surface materials such as pavers, bricks, or ~~scored/stamped~~ concrete of a different color than driving surfaces ~~or asphalt~~ to enhance pedestrian safety and comfort~~, as well as the attractiveness of the~~ walkways (see Figure 6-6-14).

(c) Adjacent nonresidential developments shall provide for vehicular and pedestrian circulation between sites, through alley or parking lot connections, hard surface walkways, and similar measures to the maximum extent practicable.

Figure 6-6-14: Pedestrian walkway from parking area to building entrance

(F) *Other design elements.* For Exterior lighting, see section 6-5; for Landscaping, buffering, and screening, see section 6-3; for Tree protection, see section 6-4; for Fences, see section 4.4-3(H).

(G) *Alternative design.* The administrator may approve an alternative to one or more of these standards, other than materials used, when an applicant demonstrates in writing that a design meets the purpose and intent of this section and is more suitable for the architectural style of the proposed building(s).

6-6.2. Design Standards for the Downtown Development District.

(A) *Intent.* The intent of this section is to encourage and maintain the viability and visual compatibility of structures and sites in the Downtown Development Overlay District.

(B) *Applicability.* New construction and exterior modification of buildings and sites in the downtown development overlay district must obtain a certificate of appropriateness prior to starting such work. In addition to other design guidelines adopted by the Main Street Advisory Board, new construction and existing buildings, structures, and sites which are altered, reconstructed, or moved shall be consistent with the architectural styles of commercial buildings constructed prior to 1950 in the downtown development overlay district and the standards of this section.

(C) *Exemptions.* Nothing in the section shall be construed to prevent the ordinary maintenance or repair of any exterior architectural feature of structures located in the Downtown Development Overlay District when the repair does not involve a change in design, material, or outer appearance of the structure. Certificates of appropriateness are not required for alterations to the interior of a building or changes in the use of a building, although other permits may be required.

(D) *Sign standards.* All signs shall require a Certificate of Appropriateness issued by the administrator prior to issuing a sign permit. The administrator may exempt signs which comply with the provisions of Section 6-9.12(C).

(E) *Site design standards.*

(1) Orientation and setback. The orientation and setback of a building shall be consistent with adjacent buildings.

(2) Spacing of buildings. The relationship of a building to open space between it and the adjoining buildings shall be visually compatible to the buildings and open spaces to which it is visually related.

(3) Parking. Parking should be located to the side or rear of a building. When a parking lot must be located adjacent to a public right-of-way, a wall and/or landscape buffer should separate the parking lot from the right-of-way.

(4) Courtyards and outdoor spaces. Walls, wrought iron fences, evergreen landscape buffers, and/or building facades shall form cohesive walls of enclosure along a street.

(F) *Building design standards.*

(1) *Height.* The height of the proposed building shall be visually compatible with adjacent buildings.

(2) *Proportion of Building from Facade.* The relationship of the width of building to the height of the front elevation shall be visually compatible with buildings to which it is visually related.
(3) *Scale of a Building.* The size of a building, the building mass of a building in relation to open spaces, the windows, door openings, porches and balconies shall be visually compatible with the buildings to which it is visually related.
(4) *Proportion of Openings within the Facility.* The relationship of the width of the windows in a building to the height of the windows shall be visually compatible with buildings to which it is visually related.
(5) *Rhythm of Solids to Voids in Front Facades.* The relationship of solids to voids in the front facade of a building shall be visually compatible with buildings to which it is visually related.
(6) *Rhythm of Entrance and/or Porch Projection.* The relationship of entrances and porch projections to the sidewalks of a building shall be visually compatible to the buildings to which it is visually related.
(7) *Relationship of Materials; Texture and Color.* The relationship of the materials, texture, and color of the facade of a building shall be visually compatible with the predominant materials in the buildings to which it is visually related. Brick or mortared stone shall be the predominant materials on new construction.
(8) *Roof Shapes.* The roof shape of a building shall be visually compatible with the buildings to which it is visually related.
(9) *Colors:* Colors should be in keeping with color palettes currently in use, or of historical significance to the City of Perry. The Community Development Department may suggest or make available certain color palettes, which are not required to have a Certificate of Appropriateness.

(G) *Temporary structures*. Temporary structures are permitted for construction projects or catastrophic loss. These structures require approval by the administrator, subject to section 4-5.

Add Section 6-7 as follows:

Sec. 6-7. - *Design standards for multifamily residential development.*

(A) *Purpose and intent.* This section establishes design standards for multifamily residential development. Multifamily development proposals shall be evaluated in the context of these standards and the decision-making body shall, to the extent feasible, balance the building and site-specific development issues with these standards. The objective of this process is to promote multifamily development that functions in a manner consistent with the provisions of section 1-3, purpose and intent, and the following:

(1) Provide a range of housing types designed for various life stages, lifestyles, and incomes;

(2) Ensure multifamily residential development takes place in a manner consistent with the nature, context, scale, and proportion of the natural and built environment within which it is located;

(3) Promote greater compatibility between multifamily residential development and other allowable uses in the city, particularly single-family residential development;

(4) Strengthen neighborhoods by incorporating best practice methods for multi-family development, such as Crime Prevention through Environmental Design (CPTED);

(5) Establish a minimum level of quality for multifamily residential development; and

(6) Preserve and improve property values and protect private and public investment.

(B) *Applicability.*

(1) Except where exempted by section 6-7(C), exemptions, these standards shall apply to all new construction, renovation, or reconstruction of existing structures accommodating three or more dwelling units, excluding townhouses (see section 4-3.1(A).

(a) Renovation and reconstruction shall be defined as construction activity having a cost that exceeds 25 percent of the current fair market value of the structures. Current fair market value shall be calculated by a licensed appraiser at the applicant's expense utilizing industry standards or the appraised values established by the appropriate county tax assessor.

(b) In cases where an existing development cannot comply with these standards during renovation or reconstruction, the administrator may rely upon the certification of a licensed architect or structural engineer to verify that compliance is not practicable.

(2) In the event of conflict between these design standards or other standards in this chapter, the more stringent or restrictive standard shall apply.

(C) *Exemptions.* The following multifamily developments are exempt from the requirements of this subsection:

(1) Structures located within the DD, Downtown Development Overlay District, provided the overlay standards and adopted design guidelines are more restrictive than the requirements of this section;

(2) Structure located within the HP, Historic Preservation Overlay District, provided the overlay standards and adopted design guidelines are more restrictive than the requirements of this section;

(3) Structures located within PUD, Planned Unit Development Districts that incorporate multifamily development design standards that are more restrictive than the requirements of this section;

(4) Structures located within Form-based Code Districts (Appendix A), provided the form-based code standards are more restrictive than the requirements of this section; and

(5) Routine maintenance and repair of multifamily residential development.

(D) *Timing of review.* Compliance with the standards in this subsection shall be determined as part of the review for a site plan permit and building permit, as appropriate.

(E) *Crime Prevention through Environmental Design.* Multifamily residential development shall adhere to the generally accepted principles of Crime Prevention through Environmental Design (CPTED), to the maximum extent practicable. These principles involve the design of walkways, fences, lighting, signage and landscape and placement of windows to enhance natural site surveillance, control access, and clearly define public and private spaces.

(F) *Multifamily design standards.*

(1) *Orientation.*

(a) Multifamily residential buildings shall be configured in a manner that activates street frontages and enhances pedestrian activity by orienting buildings and entrances towards adjacent streets, sidewalks, and open spaces (see Figure 6-7-1).

(b) Multi-building developments shall be configured so that buildings at the perimeter are similar in scale to adjacent development and there is a gradual transition to larger or more intense buildings.

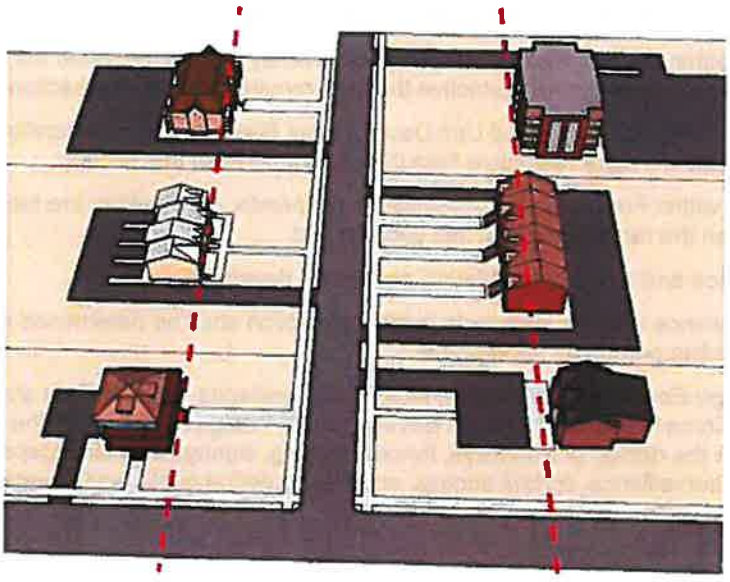
(c) Principal buildings shall be sited to maximize natural ventilation, solar access, and access to views, to the maximum extent practicable

Figure 6-7-1: Buildings oriented towards streets and sidewalks

(1) *Setbacks.*

(a) Front setbacks shall be within 75 and 125 percent of the average setback of existing structures along the same block face, provided that no building shall encroach upon the minimum setback requirement (see Figure 6-7-2). In cases where the average front setback is not discernible (e.g., the block face is vacant or lacks more than one building), the minimum front setback shall be established by the base zoning district standards.

Figure 6-2-2: Allowable front setbacks



(2) Multifamily residential buildings with three or more levels of stacked units shall be stepped back an additional ten feet from the minimum required setback for every floor above the second floor from property lines abutting single-family detached dwellings. Dormers and other minor roof features may project into the setback area.

(3) *Entrances.*

(a) All entrances shall be adequately illuminated and oriented to promote natural surveillance.

(b) Street-level, street-facing multifamily units should have a street-oriented entrance or, in-lieu thereof, a shared street-oriented entrance for every two street-level, street facing units.

(c) Street-facing entrances for individual dwellings should include at least 36 square feet of usable porch or stoop area that is elevated above street level to create a separation of public and private space and to help activate the street.

(d) Shared building entrances shall be pedestrian-scale and covered with canopies or overhangs.

(e) Exterior open stairways and corridors serving more than one dwelling and facing a public street or single-family detached dwelling are prohibited.

(4) *Building facades.*

(a) Multifamily building elevations facing a public street or single-family dwelling shall reflect consistent design, textures, colors, and features.

(b) Front building facades of 30 feet or more in width shall be configured as a series of individual building modules, wings, recesses, or projections from the primary facade wall with a minimum width of 15 feet and a maximum width of 30 feet each. Modules, wings, recesses, or bump outs shall deviate from the primary building facade plane by a distance of at least four feet.

(c) Facade treatment. Multifamily residential building facades shall incorporate at least three of the following design features (see Figure 6-7-4):

- Changes in wall plane (such as projections or recesses) with an offset or depth of at least one foot, a width of at least ten feet, located a minimum of every 25 feet;
- Distinctive architectural features, such as a repeating pattern of pilasters, columns, recesses, or niches varying from the facade plane by a minimum of four inches;
- Roofline changes, coupled with correspondingly aligned wall offset or facade material changes, including changes in the roof planes or changes in the height of a parapet wall;
- Awnings or other weather protection for pedestrians;
- Distinct changes in texture and color of wall surfaces;
- A covered front porch or other designated gathering area occupying at least 25 percent of the front facade width;
- Vertical accents or focal points such as towers, spires, cupolas, window walls, or widow walks;
- Distinctive window trim:
- Art work or bas relief;
- Repetitive ornamentation, including decorative features such as wall-mounted light fixtures, with a maximum spacing of 50 feet; or
- Other comparable elements, as approved by the decision-making body.

(d) Vents, exhaust vents, and downspouts shall be incorporated into the overall design.

(e) All building facades should incorporate a base, middle, and cap; visually lighter elements shall progress from base to cap. Distinctive architectural features such as: porches, columns, pilasters, bay windows, dormers, projecting eaves, and awnings are encouraged.

(f) Upper-story decks or patios should be configured to avoid direct views into the private spaces of adjacent single-family dwellings.

Figure 6-7-4: Facade treatment with covered porches, changes in wall plane, and distinct changes in color and texture

(5) *Service areas.*

(a) Private storage space shall be provided within, or immediately adjacent to, each dwelling.

(b) Exterior mechanical equipment, vending machines, service and delivery areas, outdoor storage, trash storage, and accessory uses and structures that may produce noise, odors, glare, vibration, etc:

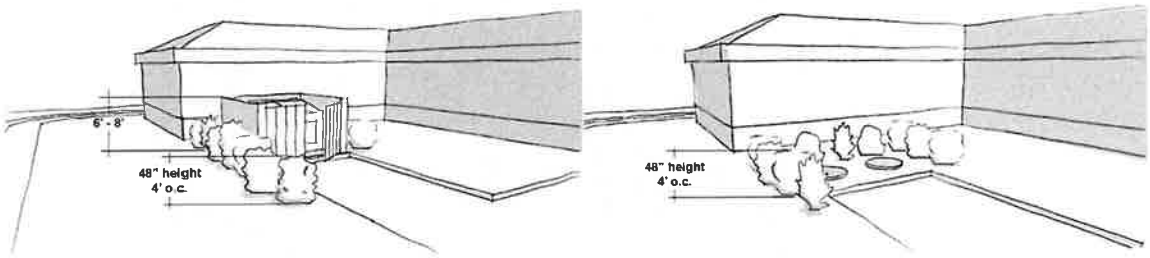
- Shall be screened from view of public and common areas and adjacent properties (see Figure 6-7-5), and
- Shall be located away from adjacent residential dwellings or integrated into the building's architecture.

Figure 6-7-5 Service area screening

(c) Above-ground refuse containers shall comply with the below standards (see Figure 6-7-6):

1. Above-ground refuse containers shall comply with the applicable setback requirements. No above-ground refuse container shall be located less than 15 feet from the property line of any abutting property improved with a single-family detached use.
2. Above-ground refuse containers shall be fully screened from the view of adjoining property and public streets. Above-ground refuse containers shall be screened in compliance with section 6-3.7. In-ground refuse containers shall be screened with evergreen plantings.

Figure 6-7-6: Example of multiple building materials



3. Times of service. Deliveries, waste collection, and similar commercial activity is prohibited between the hours of 10:00 p.m. and 6:00 a.m.

(6) *Roof form.*

(a) Pitched roofs shall include variation in planes, slope, and features (see Figure 6-7-7).

(b) Overhanging eaves and roof rakes on gable ends shall extend at least six inches past the supporting walls.

(c) Flat roofs shall incorporate parapet walls with three-dimensional cornice treatments designed to conceal the roof and roof-mounted mechanical equipment. All parapet walls visible from a public street shall be finished.

(d) The parapet wall shall be similar in color and material to the building and shall not exceed 25 percent of the height of the supporting wall.

(e) Within developments with multiple buildings, building heights shall be varied to avoid the appearance of an elongated building mass. This can be achieved by stair-stepping building heights or by varying roof forms.

(f) When adjacent to single-family detached dwellings, the roof form of multifamily residential buildings shall complement the character of surrounding structures.

(g) Green roofs, which use vegetation to improve stormwater quality and reduce runoff, may be incorporated as an alternative to the roof forms described in this subsection.

(h) All roof vents, pipes, antennae and other roof penetrations should be of a color that will minimize their visual impact unless concealed by a parapet, located on the rear elevation, or configured to have a minimal visual impact as seen from the street or existing residential development.

Figure 6-7-7 Gabled roof form

(7) *Transparency.*

(a) Street-facing facades shall have a minimum glazed area of 20 percent. All other building facades shall have a minimum glazed area of ten percent (see Figure 6-2-8).

(b) Windows shall be provided on side facades and shall be positioned to avoid direct views into the windows of an existing adjacent residential dwelling.

(c) Windows and doors of proposed dwelling units shall allow for casual surveillance of the parking and common open space areas.

(d) Windows shall complement the rhythm, size, proportion, and trim of adjacent residential buildings.

Figure 6-2-8: Multifamily window transparency

(8) *Materials.*

(a) Building facades shall incorporate a coordinated color scheme consisting of matte finishes. Gloss finishes may be used for trim and accent. Florescent and metallic paints are prohibited. However, nothing in this section shall prohibit the use of reflective colors on building roofs.

(b) Colors and finishes shall be consistent throughout the development and all sides of the buildings.

(c) Accessory buildings and structures shall be similar in materials and architectural style to the primary building.

(d) Building materials shall either be similar to the materials already being used in the immediate area or, if dissimilar materials are being proposed, other characteristics such as scale and proportions, form, architectural detailing, color, and texture shall be utilized to ensure that enough similarity exists for the building to be compatible despite the differences in materials. (See Figure 6-7-9)

Figure 6-7-9: Multifamily development in context with similar building materials

(e) Where two or more materials are proposed to be combined on a facade, the heavier and more massive elements shall be located below the lighter elements (e.g., brick shall be located below stucco). Use of a heavier material as a detail on the corner of a building or along cornices or windows is acceptable. (See Figure 6-7-10)

Figure 6-7-10: Heavier materials below lighter elements

(f) Primary facade materials shall not terminate or change at outside corners and shall continue a minimum distance of two feet from the front corners along the side facades.

(g) Material changes shall occur along a horizontal line or where two forms meet. It is acceptable, however, that change of materials occur as accents around windows, doors, cornices, or as a repetitive pattern.

(h) Brick shall be the primary material (at least 50 percent) on all facades visible from a public street. The following materials shall not be used:

- Corrugated metal siding, however, high quality architectural metal siding may be used;
- Exposed smooth-finished concrete block;

- Styrofoam-backed and synthetic stucco within 12 feet of the grade level and within two feet of any exterior door jamb (reinforced Styrofoam-backed stucco is acceptable); or
- Vinyl siding.

(9) *Open space.*

(a) A minimum of 200 square feet of open space per dwelling shall be provided, one-half of which may be private. The decision-making body may waive the provision of "common open space" or apply an alternative condition to the standard, provided the property is within a quarter mile of public open space or contains 20 or fewer dwellings.

(b) Connections to adjacent greenways, parks, trails, etc., shall be provided.

(c) Common open spaces shall be located adjacent to common facilities such as laundry rooms, mail rooms/sites and community centers; visual access to shared open spaces shall be enhanced via windows opening from kitchens, living rooms, and dining rooms.

(d) Physical access to common open space shall be as direct as feasible from the dwellings and designed to discourage nonresident access. Outdoor seating shall be encouraged to accommodate adult supervision.

(e) Active recreation facilities shall be located in a manner to reduce adverse impacts upon residents, both on- and off-site; it shall have well-defined edges such as walkways, buildings, or landscaping.

(f) Passive and active recreation space and facilities shall be provided in a form and an amount appropriate to the anticipated types of residents in the development (e.g., families with young children, the elderly, etc.). (See Figure 6-7-11)

(g) Some form of private open space (i.e., patio, porch, deck, balcony, yard, etc.) is encouraged for each dwelling with boundaries between private and common open space established by elements such as low walls and landscaping.

Figure 6-7-11: Active recreation facilities

(10) *Parking lot location.*

(a) Parking areas shall be located and designed to reduce or eliminate visual and operational impacts on surrounding lands and shall comply with the provisions of section 6-1, off street parking and loading and section 6-3, landscaping, buffering and screening.

(b) Multi-level Parking structures, when included, shall provide:

- Building facade treatment and materials similar to facades with residential units;
- Clear sight lines of abutting streets, driveways, and pedestrian pathways;
- Light-colored interior walls and ceilings; and

- Adequate and uniform interior lighting without glare to surrounding properties.

(c) Parking areas for multifamily developments with at least 20 units shall provide spaces dedicated for auto maintenance with access to water, electricity, and drainage.

(d) At least 75 percent of the provided off-street parking shall be located in the side or rear yards of multi-family residential buildings or within multi-level parking structures. Garage doors or vehicular entrance points to parking structures shall be located at least ten feet behind the street-facing building facade.

(11) *Access and circulation.*

(a) Multifamily residential development located adjacent to routes serviced by mass transit shall provide pedestrian circulation and queuing locations, if applicable, to access mass transit vehicles.

(b) Site entrance locations (vehicle and pedestrian) shall complement adjacent and opposite land use entrances in scale, design, and location. Entrances shall be located in a manner designed to retain the character of the adjacent land uses and not create adverse impacts.

(c) Ingress and egress from off-street surface parking areas serving multifamily residential development adjacent to single-family detached dwellings shall be limited to the street fronting the development. In the case of corner lots, off-street parking areas may be accessed by either street fronting the development.

(12) *Landscaping and screening.*

(a) Site development shall minimize the alteration of site topography; preserve and enhance natural resources; utilize the natural carrying capacity of the land; and comply with the provisions of section 6-3, landscaping, buffering, and screening, and section 6-4, tree protection.

(b) Installed landscaping shall be of a climate appropriate or native drought-tolerant species or shall be automatically irrigated.

(c) Landscaping shall not obscure lighting.

(d) Stormwater management facilities (such as retention ponds) should be incorporated with the landscape design of the site and be configured to serve as an active or passive recreation amenity for residents.

(e) Building foundations shall be landscaped along the full length of each front and rear facade. Landscaping shall wrap around the corners and shall continue around building sides to a logical conclusion point or a minimum distance of ten feet, whichever is less.

(f) Foundation landscaping shall have an average depth of six feet and a minimum depth of four feet from buildings. Foundation landscaping depth along a sidewalk may be reduced by up to 50 percent, where needed to provide for adequate pedestrian circulation or pedestrian amenities.

(13) *Exterior lighting.*

(a) The lighting of all parking areas, pedestrian walkways, entrances, and exterior portions of the site shall be designed for its specific task and shall comply with the provisions of section 6-5, exterior lighting.

(2) Exterior lighting fixtures shall be:

(a) Vandal-resistant;

(b) Compatible with building architecture; and

(c) Scaled (dimension and intensity) to complement its context.

(3) Adjacent to single-family dwellings:

(a) Exterior lighting heights, whether pole-mounted or wall-mounted, shall not exceed a maximum height of 15 feet above grade.

(b) Lighting levels at lot lines shall not exceed three footcandles, as measured 30 inches above grade.

(c) Uplighting of building or site features shall be directed away from adjacent properties.

(d) Internally illuminated signs or awnings are prohibited.

(14) *Pedestrian walkways.*

(a) Pedestrian walkways at least four feet wide shall be provided between buildings, streets, driveways, community spaces, and off-street parking.

(b) Changes of grade or sharp turns resulting in "blind spots" are discouraged.

(c) Walkways shall transect common open space to enhance visual access while minimizing conflicts between vehicles, bicycles, and pedestrians.

(d) Entry points and intersections of pedestrian walkways should be framed by landscaping consisting of plant, lighting, and hardscape materials scaled to the pedestrian context.

(15) *Fences and walls.*

(a) In addition to the provisions for fences in section 4-4.3(H), an eight-foot-tall masonry wall shall be constructed adjacent to single-family residential districts and single-story multifamily residential developments.

(b) When located adjacent to an existing wall or fence on a different lot, fences and walls shall be configured to avoid creation of tight corners or areas difficult to maintain.

(G) *Alternative design*. The administrator may approve an alternative to one or more of these standards, other than materials used, when an applicant demonstrates in writing that a design meets the purpose and intent of this section and is more suitable for the architectural style of the proposed building(s).

Replace Section 5-2.1 as follows: (establish minimum and maximum setbacks in commercial districts – existing setbacks become the maximum)

5-2.1. Minimum building setbacks. Minimum building setbacks are established in Table 5-1-3.

Table 5-2-1: Minimum building setbacks [1]
See Appendix A for requirements in Form Based Code districts.

Zoning District	Front Setback and Corner Lot Side Setback		Interior Lot Side Setback	Rear Setback
	Arterial/ Collector Street	Minor Street		
Residential Districts	**Minimum, No Maximum**	**Minimum, No Maximum**		
R-Ag Residential-Agricultural	50'	50'	15'	35'
R-1 Single-Family Residential	**40'**	**30'**	**10'**	**35'**
R-2 Single-Family Residential	40'	25'	8'	35'[4]
R-3 Single-Family Residential	**40'**	**25'**	**8'**	**35'[4]**
R-TH Residential Town House Development (See Section 4-3.1(A) for individual lot standards)	40'	25' [2]	25'	25'
RM-1 Multi-Family Residential	**40'**	**25'**	**C**	**35'**
Nonresidential uses in RM-1	**40'**	**25'**	**25'**	**35'**
RM-2 Multi-Family Residential	40'	25'	25'	35'
R-MH Residential Manufactured Home Development (See Section 4-3.1(B) for individual lot standards)	**40'**	**25'**	**25'**	**25'**
Commercial Districts	**Minimum/Maximum**	**Minimum/Maximum**		
OI Office Institutional District [3]	**20' / 40'**	**15' / 25'**	**A**	**A**
C-1 Highway Commercial District				
Multifamily < 7 units	20' / 40'	15' / 25'	C	25'
Multifamily > 6 units	20' / 40'	15' / 25'	25'	25'
Commercial or mixed-use	20' / 40'	15' / 25'	A	A
C-2 General Commercial District [3]				
Multifamily < 7 units	**20' / 40'**	**15' / 25'**	**C**	**25'**
Multifamily > 6 units	**20' / 40'**	**15' / 25'**	**25'**	**25'**
Commercial or mixed-use	**20' / 40'**	**15' / 25'**	**A**	**A**
C-3 Central Business District (CBD)				
Multifamily	0' / 10'	0' / 10'	A	A
Commercial or mixed-use	none	none	A	A
LC Local Commercial District [3]	**20' / 40'**	**15' / 25'**	**A**	**25'**
Industrial Districts	**Minimum, No Maximum**	**Minimum, No Maximum**		
M-1 Wholesale & Light Industrial	50'	50'	B	B
M-2 Industrial	**50'**	**50'**	**B**	**B**

A. None, except 25 feet when abutting a residential district.
B. None, except 50 feet when abutting a residential district.
C. 8' plus 2 additional feet for each story above 2 stories.

1. Setbacks for accessory structure are 5 feet from rear and interior side property lines, unless the otherwise required setback listed above is less. (Also see Sec. 4-4.2(E))
2. The minimum front setback for townhouses abutting a pocket greenspace is 10'.
3. Single-family dwellings in non-residential districts shall comply with the setbacks established in the R-3 zoning district.
4. 25' for properties created by a preliminary plat approved prior to October 18, 2022.

Replace Section 6-5 in its entirety and replace as follows:

~~**Sec. 6-5. Exterior lighting.**~~

~~6-6.1. Outdoor lighting of all types shall be directed so as to reflect away from all residential dwellings and shall be so situated as not to reflect directly into any public rights-of-way.~~

Sec. 6.5. *Exterior lighting.*

6-5.1. *Purpose.* Exterior lighting shall meet functional and security needs in a way that does not adversely affect adjacent properties or street rights-of-way. The degree to which exterior lighting affects a property or street right-of-way should consider the light source, level of illumination, hours of illumination, and the need for illumination.

6-5.2. *Applicability.* The requirements of this section shall apply to all lands within the city with the exception of properties owned by the City of Perry, Houston or Peach County, Houston County Board of Education, or State of Georgia. Lighting required by the Federal Aviation Administration and the Georgia Department of Transportation are exempt from these requirements.

6-5.3. *General design standards.* All exterior lighting shall meet the following design standards:

(A) No blinking, flashing or fluttering lights or other illuminated device that have a changing light intensity, brightness, or color is permitted in any district except for temporary holiday displays.

(B) Neither the direct nor reflected light from any outdoor light source shall create a ~~traffic~~ hazard to operators of motor vehicles or to operators of aircraft and no colored lights may be used in such a way as to be confused or construed as street-traffic control or air-traffic control devices.

(C) Background spaces such as parking lots shall be illuminated as unobtrusively as possible to meet the functional needs of safe circulation and protection of people and property. Foreground spaces, such as building entrances and outside seating areas, shall utilize local lighting that defines the space without glare.

(D) Light sources shall be concealed or shielded to the maximum extent feasible to minimize the potential for direct glare and unnecessary diffusion on adjacent property and rights-of-way.

(E) The style of light standards and fixtures shall be consistent with the style and character of architecture proposed on the site.

(F) All outdoor lighting not necessary for security purposes shall be reduced, activated by motion sensors devices, or turned off during non-operating hours.

(G) Light fixtures used to illuminate flags, statues, or any other objects mounted on a pole, pedestal, or platform shall use a narrow cone beam or light that shall not extend beyond the illuminated object.

(H) For upward-directed architectural, landscape, and decorative lighting, direct light emissions shall not be visible above the building roof line.

(I) Light fixtures shall be located on the periphery of the areas with light sources directed into parking areas. No light sources shall be located on building facades directed outward toward property boundaries or adjacent rights-of-way.

6-5.4. *Specific standards for lighting.*

(A) Light fixtures within single- and multi-family residential districts shall be wall-mounted or mounted on ~~wood, concrete, fiberglass, or painted metal~~ poles no higher than 15 feet above finished grade. Bollard-type lighting fixtures shall have a height not less than three feet or more than four feet.

(B) Light fixtures within nonresidential districts shall be wall-mounted or mounted on ~~wood, concrete, fiberglass, or painted metal~~ poles; with the exception of outdoor entertainment uses, athletic fields, and GDOT interstate interchange high-mast lighting, mounting heights shall not exceed 30 feet above finished grade. Bollard-type lighting fixtures shall have a height not less than three feet or more than four feet.

~~(C) Shielding.~~

~~(1) Luminaires of 175 watts or less may be used without cutoff except that no direct glare shall be perceptible to persons on a public right-of-way.~~

~~(2) Luminaires of between 175 watts and 400 watts shall feature, at a minimum, semi-cutoff.~~

~~(3) Luminaires in excess of 400 watts shall feature full cut-off and shall not emit any direct light above the horizontal plane of the fixture.~~

~~(4) Shielding shall not be required for lamps which accent entranceways, art, water features/fountains, landscaping, sculptures, statuary, and other similar objects provided the light is concealed and narrowly focused on the object of interest.~~

~~(5) Wall pack fixtures shall be full cut-off.~~

~~(6) Luminaries lighting vertical surfaces from the bottom up (building facades, steeples, trees, billboards, signs, flags, etc.) shall not exceed 175 watts with the exception of GDOT highway signage luminaires.~~

(D) Lighting levels.

(1) Lighting for on-site parking areas, pedestrian walkways and sidewalks, and on-site streets and driveways shall maintain an average illumination of at least one footcandle.

(2) Light level shall be no greater than 0.3 footcandle when measured at the property line abutting property improved with a residential use and one footcandle when measured at the property line abutting property improved with a non-residential use or the public right-of-way.

(3) The maximum light level at any point on a property shall not exceed 20 maintained footcandles.

(4) For property improved with non-residential commercial and multi-family uses that abut a property line of a single-family detached residential use, exterior illumination levels shall be reduced to 25 percent or less of the normal permitted levels one hour after business closing to one hour before business opening. Security lighting may be used within these restricted time periods. Security lighting shall be reduced to 25 percent or less of the normal permitted levels. Motion sensor activation may be allowed to cause the light to resume normal permitted illumination levels only when activated and shall be programmed to be reduced back to 25 percent or less of normal illumination levels within five minutes after activation has ceased. Motion sensors must be configured such that they are not triggered by activity off of the property.

(E) Outdoor entertainment uses shall comply with the following standards.

(1) Luminaire mounting heights shall not exceed 80 feet above finished grade.

(2) Luminaires shall be equipped with glare control packages (louvers, shields, visors, or similar) and the fixtures shall be aimed to direct their beams within the primary performance area.

(3) Luminaires shall be extinguished within one hour of the end of an event, or as soon as all patrons exit the premises, whichever is earlier.

(F) Canopy lighting. Areas under vehicular canopies shall have a maximum point of horizontal illuminance of 20 maintained footcandles. The sides or top of the canopy shall not be illuminated, except as permitted by ~~permanent~~ sign standards, section 6.9. Lighting under canopies shall be designed so as to not create glare beyond the outside edge of the canopy; acceptable methods include the following:

(1) The use of recessed fixtures incorporating lens covers that are recessed or flush with the bottom surface (ceiling) of the canopy; or

(2) The use of light fixture shields on the canopy edge itself.

6-5.5 *Light measurement.* Light measurements shall be made with an approved metering device at ground level (finished grade) consistent with manufacturer's specifications. The meter shall have an accuracy tolerance of no greater than plus or minus five percent and shall have been calibrated within one year of use. Light levels are specified, calculated, and measured in footcandles (FC). All FC values referenced in this section are maintained footcandles.

Illuminating
ENGINEERING SOCIETY

JOINT IDA - IES

MODEL LIGHTING ORDINANCE (MLO)

with USER'S GUIDE

June 15, 2011

The User Notes

The User Notes are intended to clarify the sections of the MLO for the various audiences who will use it: lighting designers, city officials, engineers, citizen groups, and others. Every effort has been made to keep the language technically accurate and clear, but since different disciplines may use the same term in different ways, or have different interpretations, some guidance may be helpful. While these Notes can not be a full tutorial on modern lighting design, it is hoped that the Notes will help facilitate the dialogue necessary to adopt the MLO.

Background

The problems of light pollution first became an issue in the 1970s when astronomers identified the degradation of the night sky due to the increase in lighting associated with development and growth. As more impacts to the environment by lighting have been identified, an international "dark sky" movement is advocating for the precautionary approach to outdoor lighting design.

Many communities have passed anti-light-pollution laws and ordinances. However, there is little or no agreement among these laws, and they vary considerably in language, technical quality, and stringency. This is confusing for designers, engineers, and code officials. The lack of a common basis prevents the development of standards, educational programs, and other means of achieving the goal of effective lighting control.

This MLO will allow communities to drastically reduce light pollution and glare and lower excessive light levels. The recommended practices of the IES can be met using readily available, reasonably priced lighting equipment. However, many conventional lighting practices will no longer be permitted, or will require special permits.

This Model Lighting Ordinance (MLO) is the result of extensive efforts by the International Dark Sky Association (IDA) and the Illuminating

Engineering Society of North America (IES). Among its features is the use of lighting zones (LZ0-4) which allow each governing body to vary the stringency of lighting restrictions according to the sensitivity of the area as well as accommodating community intent. In this way, communities can fine-tune the impact of the MLO without having to customize the MLO. The MLO also incorporates the Backlight-Uplight-Glare (BUG) rating system for luminaires, which provides more effective control of unwanted light.

Joint IDA-IESNA Model Outdoor Lighting Ordinance (MLO)

June 15, 2011

CONTENTS

General Notes in Adopting this Model Ordinance

Adoption of this ordinance should follow the established development, review, and approval processes of the adopting authority. If no such processes are in place, this ordinance may be adopted as a new independent section of the Municipal Code.

The MLO is probably best adopted as an "overlay zoning" ordinance. This means that it overlays, but is different from, land-use zoning. It can be added to or integrated into existing ordinances or codes and cross-referenced to other applicable codes and ordinances such as the electrical code, the sign code, planning ordinances, etc.

The MLO may best be managed by assigning it to planning officials and using existing administrative structures.

Because of the diverse community and lighting needs across large areas, this MLO is not intended for adoption as a state, provincial or national ordinance. Regional coordination is encouraged. Light pollution knows no boundaries, and the effects of polluting light persist as far as 200 kilometers (about 120 miles) from the source. One large city could adopt the MLO and dramatically affect a region, but adoption in suburbs and small towns must be part of a regional effort to achieve significant improvements in the overall quality of the night sky.

Adopting agencies should also consider that the MLO, like all other modern codes, is designed to evolve over time. Lighting technology will change, and MLO changes will be needed every few years. On-going renewal cycles are strongly recommended as any part of an adopting ordinance.

MLO Development and Task Force Members

This Model Lighting Ordinance has been developed as a joint undertaking by the Illuminating Engineering Society and the International Dark-Sky Association.

The Joint Task Force responsible for developing the MLO include

IDA	IES
Co-Chair: Jim Benya	Naomi Miller
Co-Chair: Nancy Clanton	Cheryl English
Leslie Lipstein	Denis Lavoie
Leo Smith	Eric Gibson
Michael Mutmansky	

John Walter representing the electric utility industry also contributed as a member of the Joint Task Force.

I. PREAMBLE - User's Guide

In general, the preamble is part of the ordinance but is typically not part of the code. It establishes the reasons why the municipality is undertaking these regulations.

Local governments may add other purposes to the Preamble including established local government environmental or energy goals that support the model lighting ordinance. The environmental impacts of outdoor lighting fall into two categories: carbon footprint (energy used in the life of a lighting product) and obtrusive light.

CARBON FOOTPRINT	OBTRUSIVE LIGHT
Cost & Impact of Mining the Materials Used	Impact on Humans
Energy Used in Production	Impact on the Environment
Energy Used during Product Life	
Disposal/Recylcing Costs	

II. LIGHTING ZONES - User's Guide

Lighting zones reflect the base (or ambient) light levels desired by a community. The use of lighting zones (LZ) was originally developed by the International Commission on Illumination (CIE) and appeared first in the US in IES Recommended Practice for Exterior Environmental Lighting, RP-33-99.

It is recommended that lower lighting zone(s) be given preference when establishing zoning criteria. Selection of lighting zone or zones should be based not on existing conditions but rather on the type of lighting environments the jurisdiction seeks to achieve. For instance, new development on previously rural or undeveloped land may be zoned as LZ-1.Using lighting zones allows a great deal of flexibility and customization without the burden of excessive regulation. For example, a jurisdiction may choose to establish vertical lighting zones with the lighting zone at street level at a higher zone than the residential housing on upper levels.

I. PREAMBLE - Ordinance Text

The purpose of this Ordinance is to provide regulations for outdoor lighting that will:

a. Permit the use of outdoor lighting that does not exceed the minimum levels specified in IES recommended practices for night-time safety, utility, security, productivity, enjoyment, and commerce.

b. Minimize adverse offsite impacts of lighting such as light trespass, and obtrusive light.

c. Curtail light pollution, reduce skyglow and improve the nighttime environment for astronomy.

d. Help protect the natural environment from the adverse effects of night lighting from gas or electric sources.

e. Conserve energy and resources to the greatest extent possible.

II. LIGHTING ZONES - Ordinance Text

The Lighting Zone shall determine the limitations for lighting as specified in this ordinance. The Lighting Zones shall be as follows:

LZ0: No ambient lighting

Areas where the natural environment will be seriously and adversely affected by lighting. Impacts include disturbing the biological cycles of flora and fauna and/or detracting from human enjoyment and appreciation of the natural environment. Human activity is subordinate in importance to nature. The vision of human residents and users is adapted to the darkness, and they expect to see little or no lighting. When not needed, lighting should be extinguished.

II. LIGHTING ZONES (cont.) - User's Guide

However, if an adjacent use could be adversely impacted by allowable lighting, the adopting authority may require that a particular site meet the requirements for a lower lighting zone. For example, the authority could specify Lighting Zone 1 or 2 requirements if a commercial development were adjacent to a residence, hospital or open space, or to any land assigned to a lower zone.

Lighting zones are best implemented as an overlay to the established zoning especially in communities where a variety of zone districts exists within a defined area or along an arterial street. Where zone districts are cohesive, it may be possible to assign lighting zones to established land use zoning. It is recommended that the lighting zone includes churches, schools, parks, and other uses embedded within residential communities.

Zone	Recommended Uses or Areas	Zoning Considerations
LZ-0	Lighting Zone 0 should be applied to areas in which permanent lighting is not expected and when used, is limited in the amount of lighting and the period of operation. LZ-0 typically includes undeveloped areas of open space, wilderness parks and preserves, areas near astronomical observatories, or any other area where the protection of a dark environment is critical. Special review should be required for any permanent lighting in this zone. Some rural communities may choose to adopt LZ-0 for residential areas.	Recommended default zone for wilderness areas, parks and preserves, and undeveloped rural areas. Includes protected wildlife areas and corridors.
LZ-1	Lighting Zone 1 pertains to areas that desire low ambient lighting levels. These typically include single and two family residential communities, rural town centers, business parks, and other commercial or industrial/ storage areas typically with limited nighttime activity. May also include the developed areas in parks and other natural settings.	Recommended default zone for rural and low density residential areas. Includes residential single or two family; agricultural zone districts; rural residential zone districts; business parks; open space include preserves in developed areas.

II. LIGHTING ZONES (cont.) - Ordinance Text

LZ1: Low ambient lighting

Areas where lighting might adversely affect flora and fauna or disturb the character of the area. The vision of human residents and users is adapted to low light levels. Lighting may be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, most lighting should be extinguished or reduced as activity levels decline.

LZ2: Moderate ambient lighting

Areas of human activity where the vision of human residents and users is adapted to moderate light levels. Lighting may typically be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, lighting may be extinguished or reduced as activity levels decline.

LZ3: Moderately high ambient lighting

Areas of human activity where the vision of human residents and users is adapted to moderately high light levels. Lighting is generally desired for safety, security and/or convenience and it is often uniform and/or continuous. After curfew, lighting may be extinguished or reduced in most areas as activity levels decline.

LZ4: High ambient lighting

Areas of human activity where the vision of human residents and users is adapted to high light levels. Lighting is generally considered necessary for safety, security and/or convenience and it is mostly uniform and/or continuous. After curfew, lighting may be extinguished or reduced in some areas as activity levels decline.

II. LIGHTING ZONES (cont.) - User's Guide

Zone	Recommended Uses or Areas	Zoning Considerations
LZ-2	**Lighting Zone 2 pertains to areas with moderate ambient lighting levels. These typically include multifamily residential uses, institutional residential uses, schools, churches, hospitals, hotels/motels, commercial and/or businesses areas with evening activities embedded in predominately residential areas, neighborhood serving recreational and playing fields and/or mixed use development with a predominance of residential uses. Can be used to accommodate a district of outdoor sales or industry in an area otherwise zoned LZ-1.**	**Recommended default zone for light commercial business districts and high density or mixed use residentialdistricts.** Includes neighborhood business districts; churches, schools and neighborhood recreation facilities; and light industrial zoning with modest nighttime uses or lighting requirements.
LZ-3	**Lighting Zone 3 pertains to areas with moderately high lighting levels. These typically include commercial corridors, high intensity suburban commercial areas, town centers, mixed use areas, industrial uses and shipping and rail yards with high night time activity, high use recreational and playing fields, regional shopping malls, car dealerships, gas stations, and other nighttime active exterior retail areas.**	**Recommended default zone for large cities' business district.** Includes business zone districts; commercial mixed use; and heavy industrial and/or manufacturing zone districts.
LZ-4	**Lighting zone 4 pertains to areas of very high ambient lighting levels. LZ-4 should only be used for special cases and is not appropriate for most cities. LZ-4 may be used for extremely unusual installations such as high density entertainment districts, and heavy industrial uses.**	**Not a default zone.** Includes high intensity business or industrial zone districts.

III. GENERAL REQUIREMENTS - User's Guide

This Section sets out the requirements that apply to all lighting, both residential and non-residential.

Each adopting jurisdiction should incorporate their existing standards as to when compliance with new regulations is required, when repair or remodeling triggers compliance and if the new ordinance will be retroactive to existing development. The Applicability section of this model ordinance should serve as a guide if the adopting jurisdiction does not have standards or policies in place. Likewise, the adopting jurisdiction should use their existing policies and definitions of what constitutes public monuments, and temporary and/or emergency lighting. Community attitudes and precedents should be taken into account in deciding to regulate seasonal holiday lighting.

EXEMPTIONS - User's Guide

This is standard language intended to prevent conflict of laws and to give the community the ability to set specific lighting requirements in special plans and under use permits. It can be amended to conform to similar language in other ordinances. For example, while public monuments, statuary, and flags should be lighted, the lighting also should be limited to avoid excess.

Lighting for streets, roads, and highways is usually regulated by a street lighting ordinance, and is not covered by this model ordinance. However, since street lighting can affect nearby areas, some recognition of its effect is appropriate. (See Section XI)

SIGN LIGHTING - User's Guide

A sign lighting ordinance is strongly recommended if not already in place. It should carefully limit lighting to prevent over-lighted signs from being used to circumvent lighting ordinances.

III. GENERAL REQUIREMENTS - Ordinance Text

A. Conformance with All Applicable Codes

All outdoor lighting shall be installed in conformance with the provisions of this Ordinance, applicable Electrical and Energy Codes, and applicable sections of the Building Code.

B. Applicability

Except as described below, all outdoor lighting installed after the date of effect of this Ordinance shall comply with these requirements. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party.

Exemptions from III.(B.) The following are not regulated by this Ordinance

a. Lighting within public right-of-way or easement for the principal purpose of illuminating streets or roads. No exemption shall apply to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside the public right of way or easement, unless regulated with a streetlighting ordinance.

Note to adopting agency: if using the street lighting ordinance (Section XI), this exemption should read as follows:

Lighting within the public right-of-way or easement for the principal purpose of illuminating roads and highways. No exemption shall apply to any street lighting and to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside of the public right of way or easement.

b. Lighting for public monuments and statuary.

c. Lighting solely for signs (lighting for signs is regulated by the Sign Ordinance).

d. Repairs to existing luminaires not exceeding 25% of total installed luminaires.

LIGHTING CONTROLS - User's Guide

This section requires all outdoor lighting to have lighting controls that prohibit operation when sufficient daylight is available, and to include the capability, either through circuiting, dimming or alternating sources, to be able to reduce lighting without necessarily turning all lighting off.

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

e. Temporary lighting for theatrical, television, performance areas and construction sites;

f. Underwater lighting in swimming pools and other water features

g. Temporary lighting and seasonal lighting provided that individual lamps are less than 10 watts and 70 lumens.

h. Lighting that is only used under emergency conditions.

i. In lighting zones 2, 3 and 4, low voltage landscape lighting controlled by an automatic device that is set to turn the lights off at one hour after the site is closed to the public or at a time established by the authority.

Exceptions to III. (B.) All lighting shall follow provisions in this ordinance; however, any special requirements for lighting listed in a) and b) below shall take precedence.

a. Lighting specified or identified in a specific use permit.

b. Lighting required by federal, state, territorial, commonwealth or provincial laws or regulations.

C. Lighting Control Requirements

1. Automatic Switching Requirements
   Controls shall be provided that automatically extinguish all outdoor lighting when sufficient daylight is available using a control device or system such as a photoelectric switch, astronomic time switch or equivalent functions from a programmable lighting controller, building automation system or lighting energy management system, all with battery or similar backup power or device.

CURFEW REQUIREMENTS - User's Guide

The intent is to reduce or eliminate lighting after a given time. Benefits include reduced environmental impact, longer hours of improved astronomy, energy savings, and improved sleeping conditions for residents. Additionally, some police departments have indicated that post-curfew light reductions make drive-by patrolling easier because it allows them to see further into and through a site.

The authority should determine the time of curfew and the amount of lighting reduction based on the character, norms and values of the community.

Typically, curfews go into effect one hour after the close of business. Restaurants, bars and major entertainment facilities such as sports stadiums, may require the curfew go into effect two hours after the close of business. The authority may elect to have no curfew for facilities with shift workers and 24 hour operations, or to extend the curfew time to meet specific needs. The MLO can be modified to address those concerns.

Areas without street lights or with very low ambient light levels should consider turning off all non-emergency lighting at curfew while commercial areas or urban areas may prefer a reduction in lighting levels. A reduction of at least 30% is recommended for most uses.

III. GENERAL REQUIREMENTS (cont.) - Ordinance Text

Exceptions to III.(C.) 1. Automatic lighting controls are not required for the following:

a. Lighting under canopies.

b. Lighting for tunnels, parking garages, garage entrances, and similar conditions.

2. Automatic Lighting Reduction Requirements
The Authority shall establish curfew time(s) after which total outdoor lighting lumens shall be reduced by at least 30% or extinguished.

Exceptions to III.(C.) 2. Lighting reductions are not required for any of the following:

a. With the exception of landscape lighting, lighting for residential properties including multiple residential properties not having common areas.

b. When the outdoor lighting consists of only one luminaire.

c. Code required lighting for steps, stairs, walkways, and building entrances.

d. When in the opinion of the Authority, lighting levels must be maintained.

e. Motion activated lighting.

f. Lighting governed by special use permit in which times of operation are specifically identified.

g. Businesses that operate on a 24 hour basis.

IV. NON-RESIDENTIAL LIGHTING - User's Guide

This section addresses non-residential lighting and multiple-family residences having common spaces, such as lobbies, interior corridors or parking. Its intent is to:

- **Limit the amount of light that can be used**
- **Minimize glare by controlling the amount of light that tends to create glare**
- **Minimize sky glow by controlling the amount of uplight**
- **Minimize the amount of off-site impacts or light trespass**

This MLO provides two methods for determining compliance. The *prescriptive method* contains precise and easily verifiable requirements for luminaire light output and fixture design that limit glare, uplight, light trespass and the amount of light that can be used. The *performance method* allows greater flexibility and creativity in meeting the intent of the ordinance. Note that both the prescriptive and the performance method limit the *amount* of light that can be used, but do not control *how* the lighting is to be used.

Most outdoor lighting projects that do not involve a lighting professional will use the prescriptive method, because it is simple and does not require engineering expertise.

For the prescriptive method, the initial luminaire lumen allowances defined in Table A (Parking Space Method) or B (Hardscape Area Method) will provide basic lighting (parking lot and lighting at doors and/or sensitive security areas) that is consistent with the selected lighting zone. The prescriptive method is intended to provide a safe lighting environment while reducing sky glow and other adverse offsite impacts. The Per Parking Space Method is applicable in small rural towns and is a simple method for small retail "mom and pop" operations without drive lane access and where the parking lot is immediately adjacent to the road. A jurisdiction may

IV. NON-RESIDENTIAL LIGHTING - Ordinance Text

For all non-residential properties, and for multiple residential properties of seven domiciles or more and having common outdoor areas, all outdoor lighting shall comply either with Part A or Part B of this section.

PRESCRIPTIVE METHOD - User's Guide

also allow a prescriptive method for classes of sites, such as car dealerships, gas stations, or other common use areas.

Note that the values are for initial luminaire lumens, not footcandles on the target (parking lot, sidewalk, etc). Variables such as the efficiency of the luminaire, dispersion, and lamp wear can affect the actual amount of light so the lumens per square foot allowance is not equal to footcandles on the site. By specifying initial luminaire lumen values, it is easier for officials to verify that the requirement is being met. Initial luminaire lumens are available from photometric data. Each initial luminaire lumens calculation should be supplied on the submittal form.

Solid state luminaires, such as LEDs, do not have initial lamp lumens, only initial luminaire lumens (absolute photometry). Other luminaires tested with relative photometry will have initial luminaire lumens which can be calculated by multiplying initial lamp lumens by the luminaire efficiency. In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840.

The allowable lumens are based on the lighting zone and the total hard-scape area. Referencing Table B, the allowed lumens are 2.5/SF for LZ2. Multiplying this by the total hardscape square footage gives a value of 250,000 lumens allowed. Because this value is greater than the value calculated for the site, the project complies. Listed below is an example on a typical compliance worksheet for the Prescriptive Method.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

A. Prescriptive Method

An outdoor lighting installation complies with this section if it meets the requirements of subsections 1 and 2, below.

1. Total Site Lumen Limit

   The total installed initial luminaire lumens of all outdoor lighting shall not exceed the total site lumen limit. The total site lumen limit shall be determined using either the Parking Space Method (Table A) or the Hardscape Area Method (Table B). Only one method shall be used per permit application, and for sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens.

   The total installed initial luminaire lumens is calculated as the sum of the initial luminaire lumens for all luminaires.

IV. NON-RESIDENTIAL LIGHTING (cont.) - User's Guide

In this example, three types of luminaires are used to light a parking area and building entry in a light commercial area. Two of these three luminaires use metal halide lamps: 70 watt wall mounted area lights and 150 watt pole mounted area lights. For these, the Initial Luminaire Lumens is equal to the initial lamp lumens multiplied by the luminaire efficiency. These values are entered into the compliance chart. The lumen value for the building mounted LED luminaires is equal to the lumens exiting the luminaire. Therefore, the value already represents the Initial Luminaire Lumens and no luminaire efficiency is needed. The total Luminaire Lumens for the site is equal to 247,840. The allowable lumens are based on the lighting zone and the total hardscape area. Referencing Table B, the allowed lumens are 2.5/SF for LZ2. Multiplying this by the total hardscape square footage gives a value of 250,000 lumens allowed. Because this value is greater than the value calculated for the site, the project complies.

PRESCRIPTIVE METHOD EXAMPLE - COMPLIANCE CHART			
Lamp Descriptions	*QTY*	*Initial Luminaire Lumens*	*Total*
70 W Metal Halide	8	3,920	31,360
150 W Metal Halide	20	9,600	192,000
18 W LED	24	1,020	24,480
TOTAL INITIAL LUMINAIRE LUMENS			247,840
SITE ALLOWED TOTAL INITIAL LUMENS*			250,000
PROJECT IS COMPLIANT?			YES

* Listed below is the method of determining the allowed total initial lumen for non-residential outdoor lighting using the hardscape areamethod. (Table B).

SITE ALLOWED TOTAL INITIAL LUMENS	
Site Description	Light Commercial
Lighting Zone	LZ-2
Hardscape Area (SF)	100,000
Allowed Lumens per SF of Hardscape (Table B)	2.5
Site Allowed Total Initial Lumens (lumens per SF X hardscape area)	250,000

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PRESCRIPTIVE METHOD (cont.) - User's Guide

LIMITS TO OFFSITE IMPACTS

The prescriptive method of the MLO restricts uplighting, including upward light emitted by decorative luminaires. A jurisdiction may choose to preserve some types of lighting, including lighting of monuments or historic structures. In this case, the adopting jurisdiction should exempt or otherwise regulate these types of lighting carefully so that it does not inadvertently allow glaring or offensive lighting systems.

Offsite effects of light pollution include glare, light trespass, sky glow, and impacts on the nocturnal environment . All of these are functions of the fixture or luminaire design and installation. This document replaces the previous luminaire classification terminology of full cut-off, semi cut-off, and cut-off because those classifications were not as effective in controlling offsite impacts as with the new IESNA luminaire classification system as described in TM-15-07.

A traditional method of defining light trespass is to identify a maximum light level at or near the property line. However, this method does not address offensive light that is not directed toward the ground, or the intensity of glaring light shining into adjacent windows. The requirements defined in Table C limit the amount of light in all quadrants that is directed toward or above the property line. The Backlight/Uplight/Glare (BUG) rating will help limit both light trespass and glare. (A detailed explanation of the BUG system is provided in the section on Table C.)

The limits for light distribution established in Table C (for the BUG rating system) prevent or severely limit all direct upward light. A small amount of uplight reflected by snow, light-colored pavement or a luminaire's supporting arms is inevitable and is not limited by the prescriptive method of this ordinance.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PRESCRIPTIVE METHOD

2. Limits to Off Site Impacts

All luminaires shall be rated and installed according to Table C.

3. Light Shielding for Parking Lot Illumination

All parking lot lighting shall have no light emitted above 90 degrees.

Exception:

a) Ornamental parking lighting shall be permitted by special permit only, and shall meet the requirements of Table C-1 for Backlight, Table C-2 for Uplight, and Table C-3 for Glare, without the need for external field-added modifications.

PRESCRIPTIVE METHOD (cont.) - User's Guide

LIMITS TO OFFSITE IMPACTS

A seemingly non-compliant fixture, such as a post-top translucent acorn luminaire, may in certain cases meet the BUG ratings, as long as it has proper interior baffling within the acorn globe. However, the BUG ratings in Table C will limit the use of the following types of luminaires in all lighting zones:

Barn Lights

Non-Shielded Wall Packs

Floodlights or lights not aimed downward

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PERFORMANCE METHOD - User's Guide

The performance method is best for projects with complex lighting requirements or when the applicant wants or needs more flexibility in lighting design. The performance method is also used when any lighting designer plans to aim or direct any light fixture upward (above 90 degrees). An engineer or lighting professional generally will be required to design within the performance method. An adopting jurisdiction may also wish to hire an engineer or lighting professional to review and approve projects using this method and/or incorporate review of the performance method into special review procedures.

The Performance Method is also best for projects where higher lighting levels are required compared to typical area lighting. An example might be a car sales lot where more light might be required on the new cars than would be needed for a standard parking lot. Another example is a gas station canopy requiring more light than a building entrance canopy.

The first step in the Performance Method regulates overlighting by establishing the Total Initial Site Lumens (Table D) that are allowed.

Allowances include the summation of the following (Table D):

1) Initial lumen allowance per site
2) Per area (SF) of hardscape

Table E allows additional lumens for unique site conditions.
Examples of allowances include:

1) Per building entrance/exit
2) Per length (linear feet) of Outdoor Sales Frontage Perimeter
3) Per area (SF) of Vehicle Service Station Canopy
4) Plus more ...

The Site Total Initial Site Lumens allowed are a combination of allowances from Table D and Table E.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

B. Performance Method

1. Total Site Lumen Limit

The total installed initial luminaire lumens of all lighting systems on the site shall not exceed the allowed total initial site lumens. The allowed total initial site lumens shall be determined using Tables D and E. For sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens.

The total installed initial luminaire lumens of all is calculated as the sum of the initial luminaire lumens for all luminaires.

IV. NON-RESIDENTIAL LIGHTING (cont.) - User's Guide

LIMITS TO OFFSITE IMPACTS (cont.)

The second step in the Performance Method is to determine if the proposed luminaires are producing off site impacts such as glare, sky glow and light trespass. One may either use Option A which are the Maximum Allowable BUG Ratings in Table C, or Option B through computer lighting calculations show compliance with Maximum Vertical Illuminance at any point in the plane of the property line in Table F. Option B will be required for all non-residential luminaires that

A) do not have BUG ratings, or
B) exceed the BUG ratings,
C) are not fully shielded, or
D) have adjustable mountings.

For the performance method, Option B (2) requires photometric calculations for the site perimeter, to a height of no less than 33 feet (10 meters) above the tallest luminaire. Vertical illuminances at eye height (5 feet above grade) will give values that can be used to verify compliance by comparing actual site conditions to the photometric plan submitted during review.
Note that the MLO specifies 'total initial luminaire lumens' as a measurement in addition to footcandles/lux. The footcandle (lux) is equal to one lumen per square meter. Lux is the metric unit and is equal to one lumen per square meter.

IV. NON-RESIDENTIAL LIGHTING (cont.) - Ordinance Text

PERFORMANCE METHOD

2. Limits to Off Site Impacts
All luminaires shall be rated and installed using either Option A or Option B. Only one option may be used per permit application.

Option A: All luminaires shall be rated and installed according to Table C.

Option B: The entire outdoor lighting design shall be analyzed using industry standard lighting software including inter-reflections in the following manner:

1) Input data shall describe the lighting system including luminaire locations, mounting heights, aiming directions, and employing photometric data tested in accordance with IES guidelines. Buildings or other physical objects on the site within three object heights of the property line must be included in the calculations.

2) Analysis shall utilize an enclosure comprised of calculation planes with zero reflectance values around the perimeter of the site. The top of the enclosure shall be no less than 33 feet (10 meters) above the tallest luminaire. Calculations shall include total lumens upon the inside surfaces of the box top and vertical sides and maximum vertical illuminance (footcandles and/or lux) on the sides of the enclosure.

The design complies if:

a) The total lumens on the inside surfaces of the virtual enclosure are less than 15% of the total site lumen limit; and

b) The maximum vertical illuminance on any vertical surface is less than the allowed maximum illuminance per Table F.

DESIGN COMPLIANCE - User's Guide

The application form will require information about the number of luminaires, the number of lamps in each luminaire, the initial luminaire lumens for each luminaire and the initial lumen output for each lamp (based on the wattage and type of lamp selected) as well as plans showing the site area measurements. This will allow the reviewer to verify that the lumen output of all the luminaires does not exceed the allowance.

Field verification can be achieved by asking the applicant and/or owner to verify that the luminaire type, lamp type and wattages specified have been used. Also ask the applicant for photometric data for each luminaire, since the initial luminaire lumens and B-U-G ratings are stated on the photometric report.

However, if a jurisdiction requires additional on-site verification, it may also request a point-by-point photometric plan. While this will not be a true measure of compliance with the criteria of this Ordinance, comparing the actual measured levels on site to the photometric plan can be an indication whether or not the installed lighting varies from the approved design.

V. RESIDENTIAL LIGHTING - User's Guide

This section applies to single family home, duplexes, row houses, and low rise multi-family buildings of 6 dwelling units or less.

RESIDENTIAL LIGHTING EXCEPTIONS

The exceptions allow for typical lighting that might exceed the specified limits.

Landscape Lighting - While not common in residential areas, it can cause light pollution and light trespass if it is not controlled.

Lighting controlled by Vacancy (Motion) Sensor - Reduces light pollution and light trespass and should be encouraged.

RESIDENTIAL LIGHTING EXAMPLE

In this example on the following page, five different luminaires are used on a residential property. Each luminaire must comply to meet the requirements. The site plan following shows luminaire types followed by a tabulation of each uminaire, whether or not it is fully shielded, lamp type, and initial luminaire lumens. If the luminaire lumens are not known, multiply the initial lamp lumens by the luminaire efficiency. If the efficiency is not known, multiply the initial lamp lumens by 0.7 as a reasonable assumption. The maximum allowable lumen values come from Table G, based on the shielding classification and location on the site. In this case, each luminaire complies with the requirements of Table G.

Comparison of efficacy by power
(120 Volt Incandescent lamps)

Output (Lumens)	Power (Watt)		
	Incan	CFL	LED
500	40	8 - 10	9
850	60	13 - 18	12 - 15
1,200	75	18 - 22	15
1,700	100	23 - 28	18

V. RESIDENTIAL LIGHTING - Ordinance Text

A. General Requirements

For residential properties including multiple residential properties not having common areas, all outdoor luminaires shall be fully shielded and shall not exceed the allowed lumen output in Table G, row 2.

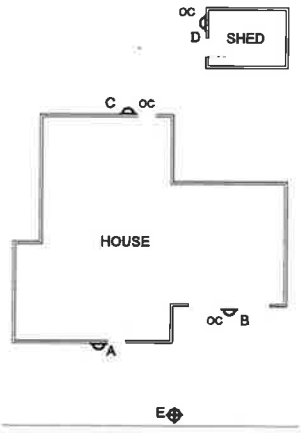
Exceptions

1. **One partly shielded or unshielded luminaire at the main entry, not exceeding the allowed lumen output in Table G row 1.**
2. **Any other partly shielded or unshielded luminaires not exceeding the allowed lumen output in Table G row 3.**
3. **Low voltage landscape lighting aimed away from adjacent properties and not exceeding the allowed lumen output in Table G row 4.**
4. **Shielded directional flood lighting aimed so that direct glare is not visible from adjacent properties and not exceeding the allowed lumen output in Table G row 5.**
5. **Open flame gas lamps.**
6. **Lighting installed with a vacancy sensor, where the sensor extinguishes the lights no more than 15 minutes after the area is vacated.**
7. **Lighting exempt per Section III (B.).**

B. Requirements for Residential Landscape Lighting

1.Shall comply with Table G.
2.Shall not be aimed onto adjacent properties.

V. RESIDENTIAL LIGHTING - User's Guide



WALL SCONCE
POST TOP LUMINAIRE
OC OCCUPANCY SENSOR

Property Type: Residential Lighting Zone 1								
Luminaire Type	Location	Luminaire Description	Fully Shielded	Lamp Type	Initial Luminiare Lumens*	Maximum Allowed Initial Luminaire Lumens (Table G)	Controls	Compliant
A	Front Entry	Decorative wall sconce	No	9W CFL	420	420	None	Yes
B	Garage Door	Fully shielded wall pack	Yes	23W CFL	1050	1260	Occupancy Sensor	Yes
C	Back Entry	Decorative wall sconce	No	7W CFL	280	315	Occupancy Sensor	Yes
D	Shed Entry	Fully shielded wall pack	Yes	40W INC	343	1260	Occupancy Sensor	Yes
E	Driveway	Fully shielded post top	Yes	13W CFL	1260	1260	None	Yes

*Initial Luminaire Lumens are calculated by multiplying the total initial lamp lumens by the luminaire efficiency.
If the luminaire efficiency is not known, assume an efficiency of 70% and multiply the lamp lumen value by 0.7.

VI. LIGHTING BY SPECIAL PERMIT ONLY - User's Guide

This section addresses types of lighting that are intrusive or complex in their impacts and need a higher level of scrutiny and/or site sensitivity.

It should be noted that safety could be compromised if lighting conforming to this ordinance is located adjacent to excessively bright and/or glaring lighting.

It is important that the authority set clear and reasonable guidelines for applying for a special lighting use permit, and establish rules and procedures for granting or refusing them. They may differ from existing special use policies, in which case one or the other may be changed to achieve the overall goal of effective lighting without glare, sky glow, or light trespass.

SPORTS FIELD LIGHTING

For athletic and sports fields, the appropriate level of lighting will depend on the Class of Play and Facilities. Class of Play is divided into 4 categories, depending on the number of fixed spectator seats. (Competition play intended for nighttime TV broadcast may require higher lighting levels).

CLASS I: Competition play at facilities with 5,000 or more fixed spectator seats. (Professional, Colleges & Universities, some Semi-Professional & Large Sports Cubs)

CLASS II: Games at facilities with over 1,500 fixed spectator seats. (Smaller Universities and Colleges, some Semi-pro, large amateur leagues and high schools with large spectator facilities)

CLASS III: Games at facilities with over 500 fixed spectator seats. (Sports Clubs and amateur leagues, some high schools and large training professional training facilities with spectator sections)

CLASS IV: Competition or recreational play at facilities with 500 fixed spectator seats or less. Class IV Class of Play applies to games at which family and close friends of the players and staff are usually the majority of spectators. (Smaller amateur leagues, park and recreation department facilities, most Little Leagues smaller high schools, elementary and middle schools, and social events)

VI. LIGHTING BY SPECIAL PERMIT ONLY - Ordinance Text

A. High Intensity and Special Purpose Lighting

The following lighting systems are prohibited from being installed or used except by special use permit:

1. Temporary lighting in which any single luminaire exceeds 20,000 initial luminaire lumens or the total lighting load exceeds 160,000 lumens.
2. Aerial Lasers.
3. Searchlights.
4. Other very intense lighting defined as having a light source exceeding 200,000 initial luminaire lumens or an intensity in any direction of more than 2,000,000 candelas.

B. *Complex and Non-Conforming Uses*

Upon special permit issued by the Authority, lighting not complying with the technical requirements of this ordinance but consistent with its intent may be installed for complex sites or uses or special uses including, but not limited to, the following applications:

1. Sports facilities, including but not limited to unconditioned rinks, open courts, fields, and stadiums.
2. Construction lighting.
3. Lighting for industrial sites having special requirements, such as petrochemical manufacturing or storage, shipping piers, etc.
4. Parking structures.
5. Urban parks
6. Ornamental and architectural lighting of bridges, public monuments, statuary and public buildings.
7. Theme and amusement parks.
8. Correctional facilities.

To obtain such a permit, applicants shall demonstrate that the proposed lighting installation:

a. Has sustained every reasonable effort to mitigate the effects of light on the environment and surrounding properties, supported by a signed statement describing the mitigation measures. Such statement shall be accompanied by the calculations required for the Performance Method.

SPORTS FIELD LIGHTING

When Class of Play is above Class IV, a dual control should be installed to limit illumination to Class IV levels during practices where spectators are fewer than 500.

(See IES Recommended Practice for Sports and Recreational Area Lighting RP-6)

VII. EXISTING LIGHTING - User's Guide

Adoption of this section on existing lighting is strongly encouraged.

If the adopting jurisdiction has criteria in place that require a property to come into compliance with the current zoning ordinance, it is recommended that the criteria also be applied to bringing existing lighting into compliance. If there are no established criteria, this section of the MLO is recommended.

Amortization allows existing lighting to gradually and gracefully come into compliance. Substantial changes or additions to existing properties are considered the same as new construction, and must comply.

Most outdoor lighting can be fully depreciated once it is fully amortized, usually no longer than 10 years, if not sooner, from the date of initial installation. Some jurisdictions may prefer to require phase-out in a substantially shorter period. The Authority may also wish to require compliance much sooner for "easy fixes" such as re-aiming or lowering lumen output of lamps. Where lighting is judged to be a safety hazard, immediate compliance can be required.

VI. LIGHTING BY SPECIAL PERMIT ONLY (cont.) - Ordinance Text

b. Employs lighting controls to reduce lighting at a Project Specific Curfew ("Curfew") time to be established in the Permit.
c. Complies with the Performance Method after Curfew.

The Authority shall review each such application. A permit may be granted if, upon review, the Authority believes that the proposed lighting will not create unwarranted glare, sky glow, or light trespass.

VII. EXISTING LIGHTING - Ordinance Text

Lighting installed prior to the effective date of this ordinance shall comply with the following.

A. Amortization

On or before [amortization date], all outdoor lighting shall comply with this Code.

B. New Uses or Structures, or Change of Use

Whenever there is a new use of a property (zoning or variance change) or the use on the property is changed, all outdoor lighting on the property shall be brought into compliance with this Ordinance before the new or changed use commences.

C. Additions or Alterations

1. Major Additions.

If a major addition occurs on a property, lighting for the entire property shall comply with the requirements of this Code. For purposes of this section, the following are considered to be major additions:

VIII. ENFORCEMENT AND PENALTIES - User's Guide

Enforcement and penalties will vary by jurisdiction. There are, however, certain practices that will promote compliance with lighting regulations. Education is a key tool in promoting compliance. Proactive enforcement procedures can include providing a copy of the lighting regulations to every contractor at the time they visit to obtain a building permit. Another effective tool is a requirement that the builder or developer acknowledge in writing that the he or she is familiar with the lighting requirements and will submit a lighting plan for approval.

VII. EXISTING LIGHTING (cont.) - Ordinance Text

Additions of 25 percent or more in terms of additional dwelling units, gross floor area, seating capacity, or parking spaces, either with a single addition or with cumulative additions after the effective date of this Ordinance.

Single or cumulative additions, modification or replacement of 25 percent or more of installed outdoor lighting luminaires existing as of the effective date of this Ordinance.

2. Minor Modifications, Additions, or New Lighting Fixtures for Non-residential and Multiple Dwellings
For non-residential and multiple dwellings, all additions, modifications, or replacement of more than 25 percent of outdoor lighting fixtures existing as of the effective date of this Ordinance shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting.

Any new lighting shall meet the requirements of this Ordinance.

3. Resumption of Use after Abandonment
If a property with non-conforming lighting is abandoned for a period of six months or more, then all outdoor lighting shall be brought into compliance with this Ordinance before any further use of the property occurs.

VIII. ENFORCEMENT & PENALTIES - Ordinance Text

(Reserved)

VIII. ENFORCEMENT AND PENALTIES (cont.) - User's Guide

Submission of the Lighting Plan should be required as a precondition to any approvals. The Lighting Plan should include the location and BUG rating for each luminaire, specify whether compliance is by the performance or prescriptive method, and a worksheet to show that the luminaires and their BUG ratings are compliant.

IX. TABLES - User's Guide

The tables are to be reviewed periodically by a joint committee of the IES and IDA, and adjusted as standards and technology permit. If more research on the impacts of outdoor lighting shows the effects of light pollution to be a significant concern, then the values in the tables may be modified. Such changes will have no significant impact to the balance of the language of the Ordinance or Code.

VIII. ENFORCEMENT & PENALTIES - Ordinance Text

IX. TABLES - Ordinance Text

Table A - Allowed Total Initial Luminaire Lumens per Site for Non-residential Outdoor Lighting, Per Parking Space Method
May only be applied to properties up to 10 parking spaces (including handicapped accessible spaces).

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
350 lms/space	490 lms/space	630 lms/space	840 lms/space	1,050 lms/space

Table B - Allowed Total Initial Lumens per Site for Non-residential Outdoor Lighting, Hardscape Area Method
May be used for any project. When lighting intersections of site drives and public streets or road, a total of 600 square feet for each intersection may be added to the actual site hardscape area to provide for intersection lighting.

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Base Allowance				
0.5 lumens per SF of Hardscape	1.25 lumens per SF of Hardscape	2.5 lumens per SF of Hardscape	5.0 lumens per SF of Hardscape	7.5 lumens per SF of Hardscape

IX. TABLES - Ordinance Text

Table B - *Lumen Allowances, in Addition to Base Allowance*

	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Additional allowances for sales and service facilities. No more than two additional allowances per site, Use it or Lose it.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas. To use this allowance, luminaires must be within 2 mounting heights of sales lot area.	0	4 lumens per square foot	8 lumens per square foot	16 lumens per square foot	16 lumens per square foot
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area	0	0	1,000 per LF	1,500 per LF	2,000 per LF
Drive Up Windows. In order to use this allowance, luminaires must be within 20 feet horizontal distance of the center of the window.	0	2,000 lumens per drive-up window	4,000 lumens per drive-up window	8,000 lumens per drive-up window	8,000 lumens per drive-up window
Vehicle Service Station. This allowance is lumens per installed fuel pump.	0	4,000 lumens per pump (based on 5 fc horiz)	8,000 lumens per pump (based on 10 fc horiz)	16,000 lumens per pump (based on 20 fc horiz)	24,000 lumens per pump (based on 20 fc horiz)

IX. TABLES - TABLE C BUG RATING - User's Guide

Work on the BUG system started in 2005 when the IES upgraded the roadway cutoff classification system. The original system, which included the ratings full cutoff, cutoff, semi-cutoff and non cutoff, had been designed as a rating system focused on brightness and glare control. However, with increasing demand for control of uplight and light trespass in addition to glare, IES realized that a more comprehensive system was needed. IES developed TM-15 *Luminaire Classification System for Outdoor Luminaires*.

As this is a relatively new rating system, and many people may not be familiar with it, more explanation of how the rating system works is provided here. For example, some people are familiar with terms such as "full cutoff" and they may expect the MLO to include those terms. It will be very important that all groups recognize that older terms and concepts are inadequate for the complex tasks of controlling light pollution. It is recommended that the new rating system adopted in TM-15, as followed herein by the MLO, be used intact and exclusively.

BUG requires downlight only with low glare (better than full cut off) in lighting zones 0, 1 and 2, but allows a minor amount of uplight in lighting zones 3 and 4. In lighting zones 3 and 4, the amount of allowed uplight is enough to permit the use of very well shielded luminaires that have a decorative drop lens or chimney so that dark sky friendly lighting can be installed in places that traditional-appearing luminaires are required. BUG typically cannot be used for residential luminaires unless they have been photometrically tested. For non-photometrically tested residential luminaires, shielding description is used instead.

The lumen limits established for each lighting zone apply to all types of lighting within that zone. This includes, but is not limited to, specialty lighting, façade lighting, security lighting and the front row lighting for auto dealerships. BUG rating limits are defined for each luminaire and

IX. TABLES (cont.) - Ordinance Text

Table C - Maximum Allowable Backlight, Uplight and Glare (BUG) Ratings

May be used for any project. A luminaire may be used if it is rated for the lighting zone of the site or lower in number for all ratings B, U and G. Luminaires equipped with adjustable mounting devices permitting alteration of luminaire aiming in the field shall not be permitted.

TABLE C-1	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Backlight Rating*					
Greater than 2 mounting heights from property line	B1	B3	B4	B5	B5
1 to less than 2 mounting heights from property line and ideally oriented**	B1	B2	B3	B4	B4
0.5 to 1 mounting heights from property line and ideally oriented**	B0	B1	B2	B3	B3
Less than 0.5 mounting height to property line and properly oriented**	B0	B0	B0	B1	B2

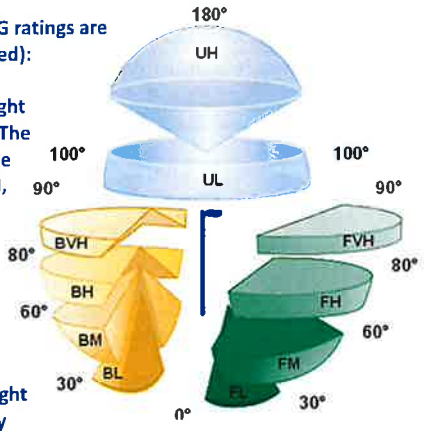
*For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the center-line of the public roadway or public transit corridor for the purpose of determining compliance with this section. NOTE: This adjustment is relative to Table C-1 and C-3 only and shall not be used to increase the lighting area of the site.

** To be considered 'ideally oriented', the luminaire must be mounted with the backlight portion of the light output oriented perpendicular and towards the property line of concern.

IX. TABLES - TABLE C BUG RATING (cont.) - User's Guide

are based on the internal and external design of the luminaire, its aiming, and the initial luminaire lumens of the specified luminaires. The BUG rating limits also take into consideration the distance the luminaire is installed from the property line in multiples of the mounting height (See Table C).

The three components of BUG ratings are based on IES TM-15-07 (revised):



Backlight, which creates light trespass onto adjacent sites. The B rating takes into account the amount of light in the BL, BM, BH and BVH zones, which are in the direction of the luminaire OPPOSITE from the area intended to be lighted.

Uplight, which causes artificial sky glow. Lower uplight (zone UL) causes the most sky glow and negatively affects professional and academic astronomy. Upper uplight (UH) not reflected off a surface is mostly energy waste. The U rating defines the amount of light into the upper hemisphere with greater concern for the light at or near the horizontal angles (UL).

Glare, which can be annoying or visually disabling. The G rating takes into account the amount of frontlight in the FH and FVH zones as well as BH and BVH zones.

BUG ratings apply to the Lighting Zone of the property under consideration.

IX. TABLES (cont.) - Ordinance Text

IX. TABLES - TABLE C BUG RATING (cont.) - User's Guide

(Key: UH=Uplight High, UL=Uplight Low, BVH=Backlight Very High, BH=Backlight High, BM=Backlight Medium, BL=Backlight Low, FVH=Forward Light Very High, FH=Forward Light High, FM=Forward Light Medium, FL=Forward Light Low.)

In general, a higher BUG rating means more light is allowed in solid angles, and the rating increases with the lighting zone. However, a higher B (backlight) rating simply indicates that the luminaire directs a significant portion of light behind the pole, so B ratings are designated based on the location of the luminaire with respect to the property line. A high B rating luminaire maximizes the spread of light, and is effective and efficient when used far from the property line. When luminaires are located near the property line, a lower B rating will prevent unwanted light from interfering with neighboring properties.

At the 90-180 degree ranges:

- Zone 0 allows no light above 90 degrees.
- Zone 1 allows only 10 lumens in the UH and UL zones, 20 lumens total in the complete upper hemisphere. (This is roughly equivalent to a 5 W incandescent lamp).
- Zone 2 allows only 50 lumens in the UH and UL zones, 100 lumens total (less than a 25W incandescent lamp).
- Zone 3 allows only 500 lumens in the UH and UL zones, 1000 lumens total (about the output of a 75W incandescent bulb).
- Zone 4 allows only 1,000 lumens in the UH and UL zones, 2000 lumens total (about the output of a 100W incandescent bulb).

IX. TABLES (cont.) - Ordinance Text

Table C - 2 Maximum Allowable Uplight (BUG) Ratings - Continued

TABLE C-2	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Uplight Rating	U0	U1	U2	U3	U4
Allowed % light emission above 90° for street or Area lighting	0%	0%	0%	0%	0%

Table C - 3 Maximum Allowable Glare (BUG) Ratings - Continued

TABLE C-3	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Glare Rating	G0	G1	G2	G3	G4
Any luminaire not ideally oriented*** with 1 to less than 2 mounting heights to any property line of concern	G0	G0	G1	G1	G2
Any luminaire not ideally oriented*** with 0.5 to 1 mounting heights to any property line of concern	G0	G0	G0	G1	G1
Any luminaire not ideally oriented*** with less than 0.5 mounting heights to any property line of concern	G0	G0	G0	G0	G1

*** Any luminaire that cannot be mounted with its backlight perpendicular to any property line within 2X the mounting heights of the luminaire location shall meet the reduced Allowed Glare Rating in Table C-3.

TABLE D EXAMPLE - PERFORMANCE METHOD - User's Guide

The first step in the Performance Method is to establish the Site Total Initial Site Lumens which regulates overlighting. The performance method allows layers of light depending on the complexity of the site.

Table D establishes the basic total initial site lumens allowed. These lumen allowances are added together for a total initial site lumen allowance. Allowances include:

1) Initial lumen allowance per site

2) Per area (SF) of hardscape

IX. TABLES (cont.) - Ordinance Text

Table D Performance Method Allowed Total Initial Site Lumens

May be used on any project.

Lighting Zone	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Allowed Lumens Per SF	0.5	1.25	2.5	5.0	7.5
Allowed Base Lumens Per Site	0	3,500	7,000	14,000	21,000

Table E Performance Method Additional Initial Luminaire Lumen Allowances. All of the following are "use it or lose it" allowances.

All area and distance measurements in plan view unless otherwise noted.

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Additional Lumens Allowances for All Buildings except service stations and outdoor sales facilities. A MAXIMUM OF THREE (3) ALLOWANCES ARE PERMITTED. THESE ALLOWANCES ARE "USE IT OR LOSE IT".					
Building Entrances or Exits. This allowance is per door. In order to use this allowance, luminaires must be within 20 feet of the door.	400	1,000	2,000	4,000	6,000
Building Facades. This allowance is lumens per unit area of building façade that are illuminated. To use this allowance, luminaires must be aimed at the façade and capable of illuminating it without obstruction.	0	0	8/SF	16/SF	24/SF

TABLE E PERFORMANCE METHOD - User's Guide

The allowable light levels for these uses defined in Table E may be used to set a prescriptive lighting allowance for these uses in each lighting zone. It should be noted that the lighting allowance defined in Table E is only applicable for the area defined for that use and cannot be transferred to another area of the site. For some uses, such as outdoor sales, the jurisdiction is encourages to define a percentage of the total hardscape area that is eligible for the additional lighting allowance. For example, a set percentage of a car dealership's lot may be considered a display area and receive the additional lighting allowance where the remainder of the lot would be considered storage, visitor parking, etc. and cannot exceed the base light levels defined in Table A.

TABLE E EXAMPLE - PERFORMANCE METHOD - User's Guide

IX. TABLES (cont.) - Ordinance Text

Table E - Performance Method Additional Initial Lumen Allowances (cont.)

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Sales or Non-sales Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to qualify for this allowance, luminaires must be located under the canopy.	0	3/SF	6/SF	12/SF	18/SF
Guard Stations. This allowance is lumens per unit area of guardhouse plus 2000 sf per vehicle lane. In order to use this allowance, luminaires must be within 2 mounting heights of a vehicle lane or the guardhouse.	0	6/SF	12/SF	24/SF	36/SF
Outdoor Dining. This allowance is lumens per unit area for the total il-luminated hardscape of outdoor dining. In order to use this allowance, luminaires must be within 2 mounting heights of the hardscape area of outdoor dining	0	1/SF	5/SF	10/SF	15/SF
Drive Up Windows. This allowance is lumens per window. In order to use this allowance, luminaires must be within 20 feet of the center of the window.	0	2,000 lumens per drive-up window	4,000 lumens per drive-up window	8,000 lumens per drive-up window	8,000 lumens per drive-up window
Additional Lumens Allowances for Service Stations only. Service stations may not use any other additional allowances.					
Vehicle Service Station Hardscape. This allowance is lumens per unit area for the total illuminated hardscape area less area of buildings, area under canopies, area off property, or areas obstructed by signs or structures. In order to use this allowance, luminaires must be illuminating the hardscape area and must not be within a building, below a canopy, beyond property lines, or obstructed by a sign or other structure.	0	4/SF	8/SF	16/SF	24/SF

IX. TABLES (cont.) - Ordinance Text

Table E - Performance Method Additional Initial Lumen Allowances (cont.)

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Vehicle Service Station Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to use this allowance, luminaires must be located under the canopy.	0	8/SF	16/SF	32/SF	32/SF
Additional Lumens Allowances for Outdoor Sales facilities only. Outdoor Sales facilities may not use any other additional allowances. **NOTICE:** lighting permitted by these allowances shall employ controls extinguishing this lighting after a curfew time to be determined by the Authority.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas and shall not exceed 25% of the total hardscape area. To use this allowance, Luminaires must be within 2 mounting heights of the sales lot area.	0	4/SF	8/SF	12/SF	18/SF
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area.	0	0	1,000/ LF	1,500/ LF	2,000/ LF

IX. TABLES (cont.) - Ordinance Text

Table F Maximum Vertical Illuminance at any point in the plane of the property line

Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
0.05 FC or 0.5 LUX	0.1 FC or 1.0 LUX	0.3 FC or 3.0 LUX	0.8 FC or 8.0 LUX	1.5 FC or 15.0 LUX

TABLE G RESIDENTIAL LIGHTING - User's Guide

Residential Light Levels

Most residential lighting has traditionally used incandescent lamps which are identified by their wattage. However, since new technologies provide more light for fewer watts, it is no longer possible to regulate residential lighting solely by providing a maximum wattage. Table G, therefore, lists maximum initial luminaire lumens only.

IX. TABLES (cont.) - Ordinance Text

Table G - Residential Lighting Limits

Lighting Application	LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Row 1 Maximum Allowed Luminaire Lumens* for Unshielded Luminaires at one entry only	Not allowed	420 lumens	630 lumens	630 lumens	630 lumens
Row 2 Maximum Allowed Luminaire Lumens* for each Fully Shielded Luminaire	630 lumens	1,260 lumens	1,260 lumens	1,260 lumens	1,260 lumens
Row 3 Maximum Allowed Luminaire Lumens* for each Unshielded Luminaire excluding main entry	Not allowed	315 lumens	315 lumens	315 lumens	315 lumens
Row 4 Maximum Allowed Luminaire Lumens* for each Landscape Lighting	Not allowed	Not allowed	1,050 lumens	2,100 lumens	2,100 lumens
Row 5 Maximum Allowed Luminaire Lumens* for each Shielded Directional Flood Lighting	Not allowed	Not allowed	1,260 lumens	2,100 lumens	2,100 lumens
Row 6 Maximum Allowed Luminaire Lumens* for each Low Voltage Landscape Lighting	Not allowed	Not allowed	525 lumens	525 lumens	525 lumens

*** Luminaire lumens equals Initial Lamp Lumens for a lamp, multiplied by the number of lamps in the luminaire**

X. DEFINITIONS - User's Guide

Definitions are typically generally added to any code when new code sections are added. The definitions are legally required and play a significant role in the interpretation of the ordinance and code.

Most city attorneys will not accept references to outside sources regardless of credibility, such as the IES Handbook. Thus as a general rule, a definition for an unfamiliar term (e.g. lumens) must be added by the adopting ordinance.

When adopting or integrating the MLO definitions, be sure to retire conflicting technical terminology. In particular, the latest IES Luminaire Classification System as defined in IES TM-15-07 is likely to need attention.

X. DEFINITIONS - Ordinance Text	
Absolute Photometry	Photometric measurements (usually of a solid-state luminaire) that directly measures the footprint of the luminaire. Reference Standard IES LM-79
Architectural Lighting	Lighting designed to reveal architectural beauty, shape and/or form and for which lighting for any other purpose is incidental.
Authority	The adopting municipality, agency or other governing body.
Astronomic Time Switch	An automatic lighting control device that switches outdoor lighting relative to time of solar day with time of year correction.
Backlight	For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the opposite direction of the intended orientation of the luminaire. For luminaires with symmetric distribution, backlight will be the same as front light.
BUG	A luminaire classification system that classifies backlight (B), uplight (U) and glare (G).
Canopy	A covered, unconditioned structure with at least one side open for pedestrian and/or vehicular access. (An unconditioned structure is one that may be open to the elements and has no heat or air conditioning.)
Common Outdoor Areas	One or more of the following: a parking lot; a parking structure or covered vehicular entrance; a common entrance or public space shared by all occupants of the domiciles.
Curfew	A time defined by the authority when outdoor lighting is reduced or extinguished.

X. DEFINITIONS - Ordinance Text

Emergency conditions	Generally, lighting that is only energized during an emergency; lighting fed from a backup power source; or lighting for illuminating the path of egress solely during a fire or other emergency situation; or, lighting for security purposes used solely during an alarm.
Footcandle	The unit of measure expressing the quantity oflight received on a surface. One footcandle is the illuminance produced by a candle on a surface one foot square from a distance of one foot.
Forward Light	For an exterior luminaire, lumens emitted in the quarter sphere below horizontal and in the direction of the intended orientation of the luminaire.
Fully Shielded Luminaire	A luminaire constructed and installed in such a manner that all light emitted by the luminaire, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal plane through the luminaire's lowest light-emitting part.
Glare	Lighting entering the eye directly from luminaires or indirectly from reflective surfaces that causes visual discomfort or reduced visibility.
Hardscape	Permanent hardscape improvements to the site including parking lots, drives, entrances, curbs, ramps, stairs, steps, medians, walkways and non-vegetated landscaping that is 10 feet or less in width. Materials may include concrete, asphalt, stone, gravel, etc.
Hardscape Area	The area measured in square feet of all hardscape. It is used to calculate the Total Site Lumen Limit in both the Prescriptive Method and Performance Methods. Refer to Hardscape definition.

X. DEFINITIONS - Ordinance Text

Hardscape Perimeter	The perimeter measured in linear feet is used to calculate the Total Site Lumen Limit in the Performance Method. Refer to Hardscape definition.
IDA	International Dark-Sky Association.
IESNA	Illuminating Engineering Society of North America.
Impervious Material	Sealed to severely restrict water entry and movement
Industry Standard Lighting Software	Lighting software that calculates point-by-point illuminance that includes reflected light using either ray-tracing or radiosity methods.
Lamp	A generic term for a source of optical radiation (i.e. "light"), often called a "bulb" or "tube". Examples include incandescent, fluorescent, high-intensity discharge (HID) lamps, and low pressure sodium (LPS) lamps, as well as light-emitting diode (LED) modules and arrays.
Landscape Lighting	Lighting of trees, shrubs, or other plant material as well as ponds and other landscape features.
LED	Light Emitting Diode.
Light Pollution	Any adverse effect of artificial light including, but not limited to, glare, light trespass, sky-glow, energy waste, compromised safety and security, and impacts on the nocturnal environment.

X. DEFINITIONS - Ordinance Text

Light Trespass	Light that falls beyond the property it is intended to illuminate.
Lighting	"Electric" or "man-made" or "artificial" lighting. See "lighting equipment".
Lighting Equipment	Equipment specifically intended to provide gas or electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(s), and related structures, electrical wiring, and other necessary or auxiliary components.
Lighting Zone	An overlay zoning system establishing legal limits for lighting for particular parcels, areas, or districts in a community.
Lighting Equipment	Equipment specifically intended to provide gas or electric illumination, including but not limited to, lamp(s), luminaire(s), ballast(s), poles, posts, lens(s), and related structures, electrical wiring, and other necessary or auxiliary components.
Low Voltage Landscape Lighting	Landscape lighting powered at less than 15 volts and limited to luminaires having a rated initial luminaire lumen output of 525 lumens or less.
Lumen	The unit of measure used to quantify the amount of light produced by a lamp or emitted from a luminaire (as distinct from "watt," a measure of power consumption).
Luminaire	The complete lighting unit (fixture), consisting of a lamp, or lamps and ballast(s) (when applicable), together with the parts designed to distribute the light (reflector, lens, diffuser), to position and protect the lamps, and to connect the lamps to the power supply.

***Mounting Height*: The horizontal spacing of poles is often measured in units of "mounting height". Example: "The luminaires can be spaced up to 4 mounting heights apart."**

X. DEFINITIONS - Ordinance Text

Luminaire Lumens	For luminaires with relative photometry per IES, it is calculated as the sum of the initial lamp lumens for all lamps within an individual luminaire, multiplied by the luminaire efficiency. If the efficiency is not known for a residential luminaire, assume 70%. For luminaires with absolute photometry per IES LM-79, it is the total luminaire lumens. The lumen rating of a luminaire assumes the lamp or luminaire is new and has not depreciated in light output.
Lux	The SI unit of illuminance. One lux is one lumen per square meter. 1 Lux is a unit of incident illuminance approximately equal to 1/10 footcandle.
Mounting height	The height of the photometric center of a luminaire above grade level.
New lighting	Lighting for areas not previously illuminated; newly installed lighting of any type except for replacement lighting or lighting repairs.
Object	A permanent structure located on a site. Objects may include statues or artwork, garages or canopies, outbuildings, etc.
Object Height	The highest point of an entity, but shall not include antennas or similar structures.
Ornamental lighting	Lighting that does not impact the function and safety of an area but is purely decorative, or used to illuminate architecture and/or landscaping, and installed for aesthetic effect.

X. DEFINITIONS - Ordinance Text

Ornamental Street Lighting	A luminaire intended for illuminating streets that serves a decorative function in addition to providing optics that effectively deliver street lighting. It has a historical period appearance or decorative appearance, and has the following design characteristics: · designed to mount on a pole using an arm, pendant, or vertical tenon; · opaque or translucent top and/or sides; · an optical aperture that is either open or enclosed with a flat, sag or drop lens; · mounted in a fixed position; and · with its photometric output measured using Type C photometry per IESNA LM-75-01.
Outdoor Lighting	Lighting equipment installed within the property line and outside the building envelopes, whether attached to poles, building structures, the earth, or any other location; and any associated lighting control equipment.
Partly shielded luminaire	A luminaire with opaque top and translucent or perforated sides, designed to emit most light downward.
Pedestrian Hardscape	Stone, brick, concrete, asphalt or other similar finished surfaces intended primarily for walking, such as sidewalks and pathways.
Photoelectric Switch	A control device employing a photocell or photodiode to detect daylight and automatically switch lights off when sufficient daylight is available.
Property line	The edges of the legally-defined extent of privately owned property.

X. DEFINITIONS - Ordinance Text

Relative photometry	Photometric measurements made of the lamp plus luminaire, and adjusted to allow for light loss due to reflection or absorption within the luminaire. Reference standard: IES LM-63.
Repair(s)	The reconstruction or renewal of any part of an existing luminaire for the purpose of its ongoing operation, other than relamping or replacement of components including capacitor, ballast or photocell. Note that retrofitting a luminaire with new lamp and/or ballast technology is not considered a repair and for the purposes of this ordinance the luminaire shall be treated as if new. "Repair" does **not** include normal relamping or replacement of components including capacitor, ballast or photocell.
Replacement Lighting	Lighting installed specifically to replace existing lighting that is sufficiently broken to be beyond repair.
Sales area	Uncovered area used for sales of retail goods and materials, including but not limited to automobiles, boats, tractors and other farm equipment, building supplies, and gardening and nursery products.
Seasonal lighting	Temporary lighting installed and operated in connection with holidays or traditions.
Shielded Directional Luminaire	A luminaire that includes an adjustable mounting device allowing aiming in any direction and contains a shield, louver, or baffle to reduce direct view of the lamp.
Sign	Advertising, directional or other outdoor promotional display of art, words and/or pictures.

X. DEFINITIONS - Ordinance Text

Sky Glow	The brightening of the nighttime sky that results from scattering and reflection of artificial light by moisture and dust particles in the atmosphere. Skyglow is caused by light directed or reflected upwards or sideways and reduces one's ability to view the night sky.
Temporary lighting	Lighting installed and operated for periods not to exceed 60 days, completely removed and not operated again for at least 30 days.
Third Party	A party contracted to provide lighting, such as a utility company.
Time Switch	An automatic lighting control device that switches lights according to time of day.
Translucent	Allowing light to pass through, diffusing it so that objects beyond cannot be seen clearly (not transparent or clear).
Unshielded Luminaire	A luminaire capable of emitting light in any direction including downwards.
Uplight	For an exterior luminaire, flux radiated in the hemisphere at or above the horizontal plane.
Vertical Illuminance	Illuminance measured or calculated in a plane perpendicular to the site boundary or property line.

XI. OPTIONAL STREETLIGHT ORDINANCE - User's Guide

This section was added since the first public review. It is designed to work closely with the proposed revision to ANSI/IES RP-8 Standard Practice for Roadway and Street Lighting.

Street and roadway lighting is one of the world's largest causes of artificial skyglow. Many adopting agencies will recognize that the MLO will make privately owned lighting more efficient and environmentally responsible than their street lighting systems. But because the process of designing street lighting often requires more precise lighting calculations, applying the MLO directly to street lighting is not advised. Using existing standards of street lighting is recommended, particularly IES RP-8 and AASHTO standards.

Until a new recommended practice for street lighting can be developed, this section can serve to prevent most of the uplight of street lighting systems without setting specific requirements for the amount of light, uniformity of light, or other performance factors. Adopting agencies should include these basic improvements to street lighting along with regulations to private lighting.

Lighting streets with "period" ornamental luminaires that evoke the look of a time when the light source was a gas flame can cause glare if high-lumen lamps are used. Such ornamental street lights should not exceed a BUG rating of G1. If additional illuminance and/or uniformity is desired, the ornamental fixtures should be supplemented by higher mounted fully shielded luminaires, as illustrated in RP-33-99.

Few street lighting warranting processes exist. The adopting agency needs to gauge whether a complex warranting systems is required, or if a simple one using posted speeds, presence of pedestrians, or other practical considerations is sufficient.

Examples of a current street lighting warranting system are included in the Transportation Association of Canada's Guide for the Design of Roadway Lighting 2006.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

Note to the adopting authority: the intent of this section is that it only applies to streets and not to roadways or highways.

A. Preamble

The purpose of this Ordinance is to control the light pollution of street lighting, including all collectors, local streets, alleys, sidewalks and bikeways, as defined by ANSI/IES RP-8 Standard Practice for Roadway and Street Lighting and in a manner consistent with the Model Lighting Ordinance.

B. Definitions

Roadway or Highway lighting is defined as lighting provided for freeways, expressways, limited access roadways, and roads on which pedestrians, cyclists, and parked vehicles are generally not present. The primary purpose of roadway or highway lighting is to help the motorist remain on the roadway and help with the detection of obstacles within and beyond the range of the vehicle's headlights.

Street lighting is defined as lighting provided for major, collector, and local roads where pedestrians and cyclists are generally present. The primary purpose of street lighting is to help the motorist identify obstacles, provide adequate visibility of pedestrians and cyclists, and assist in visual search tasks, both on and adjacent to the roadway.

Ornamental Street Lighting is defined as a luminaire intended for illuminating streets that serves a decorative function in addition to providing optics that effectively deliver street lighting. It has a historical period appearance or decorative appearance, and has the following design characteristics:

- designed to mount on a pole using an arm, pendant, or vertical tenon;
- opaque or translucent top and/or sides;
- an optical aperture that is either open or enclosed with a flat, sag or drop lens;
- mounted in a fixed position; and
- with its photometric output measured using Type C photometry per IESNA LM-75-01.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

C. Scope

All street lighting not governed by regulations of federal, state or other superceding jurisdiction.

EXCEPTION: lighting systems mounted less than 10.5 feet above street level and having less than 1000 initial lumens each.

D. Master Lighting Plan

The Authority shall develop a Master Lighting Plan based on the American Association of State Highway and Transportation Officials (AASHTO) Roadway Lighting Design Guide GL-6, October 2005, Chapter 2. Such plan shall include, but not be limited to, the Adoption of Lighting Zones and:

1. Goals of street lighting in the jurisdiction by Lighting Zone
2. Assessment of the safety and security issues in the jurisdiction by Lighting Zone
3. Environmentally judicious use of resources by Lighting Zone
4. Energy use and efficiency by Lighting Zone
5. Curfews to reduce or extinguish lighting when no longer needed by Lighting Zone

E. Warranting

The Authority shall establish a warranting process to determine whether lighting is required. Such warranting process shall not assume the need for any lighting nor for continuous lighting unless conditions warrant the need. Lighting shall only be installed where warranted.

XI. OPTIONAL STREETLIGHT ORDINANCE - Ordinance Text

F. Light Shielding and Distribution

All street lighting shall have no light emitted above 90 degrees.

Exception: Ornamental street lighting for specific districts or projects shall be permitted by special permit only, and shall meet the requirements of Table H below without the need for external field-added modifications.

Table H - Uplight Control Requirements for Ornamental Street Lights - by Special Permit Only

Lighting Zone	Maximum Uplight Rating
LZ-0	U-0
LZ-1	U-1
LZ-2	U-2
LZ-3	U-3
LZ-4	U-4