



Recommendations

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Recommendations to Reduce Light Pollution

The following recommendations are designed to mitigate any further increased light pollution within the Youngstown ARS LIA. Taking action now is critical to avoid further degradation of the nighttime sky in the future and ensure continued and future capabilities for the Youngstown ARS night flying mission.

Recommendations for Youngstown ARS On-Base Mitigation

To lessen the light pollution impact on-base, it is recommended that the following strategies be employed:

- Assign lighting zones across the base per UFC 3-530-01 Interior, Exterior Lighting Systems and Controls as identified in Table 39.

- Comply with UFC 3-530-01 for new construction and retrofitting of exterior lighting systems. This effort will ensure the following:
 - Color temperatures do not exceed 4100K (white light).
 - Light fixtures are fully shielded/cut-off.
 - No outdoor light above 90 degrees is emitted.
 - The minimum amount of light needed for the specific application is used.
 - Glare restrictions are in place.

In addition, the use of lighting controls is recommended for all outdoor lighting applications. Lighting controls include the use of the following as applicable:

- Lighting on/off controls



- Photo sensor controls
- Timeclock on/off controls
- User interface wireless controls

Since the base is already constructed, there may be limited opportunities to upgrade the existing lighting in the near term. However, replacing existing lighting with newer LED technologies will likely have a short payback due to less energy use, less maintenance, and reduction of sky glow.

Strict compliance with UFC 3-260-01 Airfield and Heliport Planning and Design is recommended to ensure that airfield/runway lighting emissions, both direct and reflected, are minimized.

Recommendations for Youngstown-Warren Regional Airport Mitigation

The WPRA should develop and implement an outdoor lighting strategy/management plan to minimize light pollution from all airport sources. Vienna Township does not provide outdoor lighting regulations that are adequate for airport applications. It is recommended that the airport outdoor lighting management plan include all appropriate light pollution mitigation for “landside” applications. The plan should include all facilities owned and operated by the WPRA and any contractor operations on the facilities. At a minimum outdoor lighting on the airport should include:

- Fully shielded/cut-off light fixtures for all appropriate applications
- No ambient light emitted above 90 degrees
- Light CCT not to exceed 4100K
- Use of the minimum amount of light needed for the specific application

- Lighting controls to ensure that lights are on only when required

The airfield and runways should comply with all FAA light requirements, and to the extent necessary, UFC 3-260-01, to ensure that direct and indirect light emissions affecting aircraft operations are minimized.

Recommendations for Jurisdictions Located in the LIA

Outdoor Light Ordinance and Guidelines

All jurisdictions in the LIA, including townships, cities, and villages, should implement outdoor lighting regulations to minimize the amount of light pollution in the region. This is both a quality of life issue for residents and necessary to ensure the ability of Youngstown ARS to conduct nighttime flying missions. At least the following prohibitions should be included in jurisdictions’ outdoor light regulations:

- Prohibit any lighting that is aimed, directed, or focused to cause upward-directed light;
- Prohibit the operation of searchlights for advertising purposes; and
- Prohibit the use of laser source light or similar high-intensity light that is projected above the horizontal plane.

Outdoor light regulations should include the following general requirements:

- All LED lighting should have a CCT of 3000K or less.
- All lighting fixtures should be fully shielded and downward directed.
- Lighting controls should ensure that lights are on only when required.

- Lighting plans that minimize light pollution from large developments, including commercial and industrial applications, should be required.

In addition, any jurisdiction that implements a Military Compatibility Area Overlay District (MCAOD) should ensure that development standards incorporate appropriate measures to minimize light pollution.

As discussed in Chapter 4, the use of lighting zones can be helpful in guiding development and outdoor lighting applications where different lighting needs may be required. While not required to be part of an ordinance for controlling outdoor lighting, lighting zones may be useful when preparing comprehensive plans or other land use planning documents. Table 41 provides information on outdoor lighting zones.

Table 42 provides a summary of the recommendations related to outdoor lighting for jurisdictions to implement.

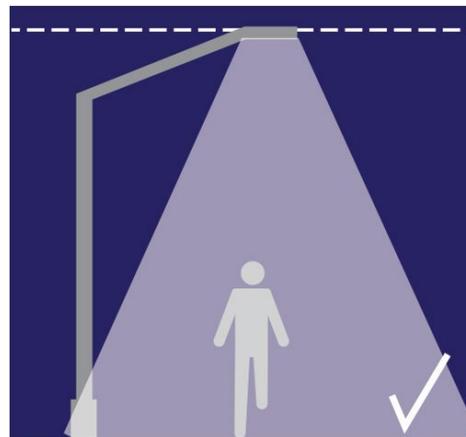
Coordination with Ohio Edison

It is recommended that jurisdictions also work with Ohio Edison on efforts to educate the public regarding opportunities and cost savings associated with retrofitting lighting in private developments, particularly developments with large parking lots or other high-intensity lighting application. Although intended to provide cost savings to private property owners, the technologies and systems used in retrofits by Ohio Edison have a positive byproduct of reducing light pollution.

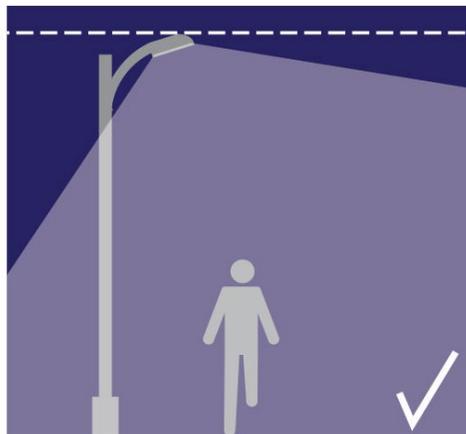
Jurisdictions should also work with Ohio Edison to retrofit any outdoor lighting, such as highways, right-of-way areas, and public facilities that are the responsibility of the jurisdiction or the utility provider. Retrofitting outdated lighting fixtures can

reduce energy costs and minimize light pollution by ensuring:

- Minimal color temperatures for the type of fixture and application
- Fixtures that are fully shielded and fully cut-off
- Provision of the minimum amount of light for the application
- Glare restrictions



Fully Shielded/Downward Directed Exterior Light Fixture.



Full Cut-off Exterior Light Fixture.



Table 42 Jurisdiction Outdoor Lighting Recommendations

Jurisdiction	Requirement						
	Shielded/Cut-off Fixtures for All Districts	Reduced Light Color Temperature	Minimum Lighting for Application	Glare Restrictions	Adequate Lighting Controls	Lighting Plans for Large Developments	Adequate Prohibitions to Reduce Ambient Light
Bazetta Township	■	■	■	■	■	■	■
Brookfield Township	■	■	■	■	■	■	■
Champion Township	■	■	■	■	■	■	■
Fowler Township	■	■	■	■	■	■	■
Hartford Township	■	■	■	■	■	■	■
Howland Township	■	■	■	■	■	■	■
Hubbard Township	■	■	■	■	■	■	■
Johnston Township	■	■	■	■	■	■	■
Liberty Township	■	■	■	■	■	■	■
Mecca Township	■	■	■	■	■	■	■
Vienna Township	■	■	■	■	■	■	■
Warren Township	■	■	■	■	■	■	■
Weathersfield Township	■	■	■	■	■	■	■
City of Cortland	■	■	■	■	■	■	■
City of Girard	■	■	■	■	■	■	■
City of Niles	■	■	■	■	■	■	■
City of Warren	■	■	■	■	■	■	■
Village of Yankee Lake	■	■	■	■	■	■	■

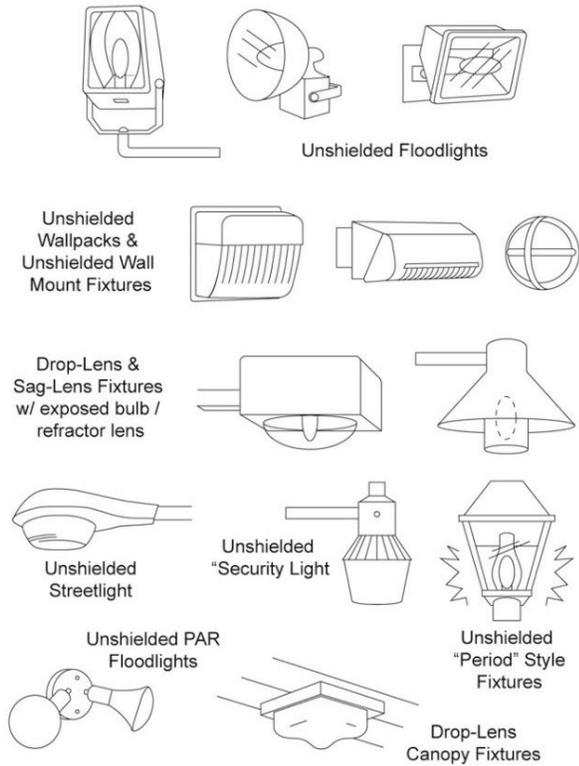
Source: Matrix, 2021.

- Denotes compliance with requirement
- Denotes partial compliance with requirement
- Denotes noncompliance with requirement

The following are examples of traditional outdoor lighting fixtures that exacerbate light pollution.

Unacceptable / Discouraged

Fixtures that produce glare and light trespass



The following are examples of modern outdoor lighting fixtures that minimize light pollution.

Acceptable

Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night

