

FAA AIRPORTS DESK REFERENCE

LIGHT EMISSIONS

CHAPTER 16. LIGHT EMISSIONS AND VISUAL EFFECTS

1. INTRODUCTION AND DEFINITIONS.

a. **Light emissions.** Airport-related lighting facilities and activities could visually affect surrounding residents and other nearby light-sensitive areas such as homes, parks or recreational areas. If there is a potential for airport lighting to disturb these sensitive land uses, the responsible FAA official should ensure the environmental document examines those effects. If potential light emissions or visual effects exist, the official should evaluate measures to lessen those as well. This helps promote a “good-neighbor” policy while protecting the resource.

b. **Visual effects.** Visual, or aesthetic, effects are inherently more difficult to define and assess because they involve subjectivity. Visual effects deal broadly with the extent to which airport development contrasts with the existing environment, architecture, historic or cultural setting, or land use planning. It is important to determine if a community or a jurisdictional agency considers visual effects from the proposed action objectionable.

2. APPLICABLE STATUTES AND IMPLEMENTING REGULATIONS

APPLICABLE STATUTES AND IMPLEMENTING REGULATIONS	SUMMARY DESCRIPTION	OVERSIGHT AGENCY
<p>There are no Federal statutory or regulatory requirements for adverse effects. State, regional, or local requirements may apply to airport-related light emissions or visual effects.</p>	<p>No Federal regulations govern light emissions or visual intrusions. However, FAA will consider potential effects to properties, and people’s use of properties, covered by Section 4(f) of the U.S. Department of Transportation (DOT) Act, Section 6(f) of the Land and Water Conservation Fund Act (LWCF), and Section 106 of the National Historic Preservation Act (NHPA). See Chapters 7 and 14 of this Desk Reference, respectively, for more information.</p>	<p>None</p>

3 APPLICABILITY TO AIRPORT DEVELOPMENT ACTIONS.

a. **Light emissions.** Airport facilities and operations cause light emissions that can affect visually sensitive land uses in an airport area. The characteristics of many runway lighting systems create potential sources of annoyance to nearby residents in the airport vicinity if light is directed towards light-sensitive land uses. Disturbing emissions may emanate from the following sources associated with a proposed action: airfield and apron lighting, visual navigational aids (NAVAIDS), terminal lighting, employee/customer parking lighting, both airborne and ground-based aircraft operations, and roadway lighting.

b. **Visual effects.** The appearance and other visual qualities of airport development projects are largely related to an action’s purpose or size, and locations of needed facilities or equipment on the airfield. Consistency with FAA and other relevant design standards and compatibility with existing structures are also important factors.

4. **PERMITS, CERTIFICATIONS, AND APPROVALS.** No permits, certifications, or approvals from Federal agencies are needed for light emissions or visual effects. However, State, regional, local agency and Tribe

approvals may be needed. If this is the case, the environmental document should identify the necessary approvals and summarize any issues that may delay or bar any approval.

5. ENVIRONMENTAL COMPLIANCE PROCEDURES – ENVIRONMENTAL ANALYSIS.

a. **Light emissions.** When potential lighting effects exist, airport sponsors should consult local residents and the owners or operators of potential light-sensitive sites. As part of these discussions, airport operators should discuss possible lighting effects and ways to minimize these effects without risking aviation safety or efficiency. The environmental document should contain records of all relevant communications with consulted parties.

b. **Visual effects.** Early consultation with State, regional, or local art or architecture councils, tribes, or other organizations having an interest in airport-associated visual effects may be helpful. For example, the visual sighting of aircraft or aircraft lights at night, particularly at a distance that is not normally intrusive, may cause an adverse visual effect. The environmental document should contain records of all relevant communications with consulted parties.

6. DETERMINING IMPACTS.

a. **General.** General and specialized lighting systems are essential parts of airport operations. General lighting is needed for safe ground movement of aircraft and vehicles. Special lighting systems, like lead-in lights, beacons, approach lights, and omni-directional lights, are needed for safe, efficient aircraft navigation and operations. The responsible FAA official should give special consideration to light emissions and visual effects to historic properties, national or state parks, recreation areas or other visually sensitive areas. To the extent light emissions and visual effects are relevant to other resource categories covered by DOT Section 4(f), the LWCF Section 6(f), and NHPA Section 106 (see chapters 7 and 14, respectively), those effects should be discussed in the relevant sections of an EA or EIS.

b. **Information needs to determine lighting and visual effects.** If there is a potential for airport-related lighting or visual effects on nearby residents or other light sensitive areas, the environmental document should evaluate those effects. This assessment should provide the following information as necessary.

(1) Light emissions.

(a) A brief description of proposed airport-related lighting. Include the purpose of the lighting, installation method (pole or ground-mounted), beam angle, intensity, flashing sequence, color of lighting, and any other important information.

(b) A map showing the locations of homes or other light-sensitive sites in the airport vicinity relative to the proposed lighting system.

(c) A description of lighting system effects on residents and light-sensitive sites in the airport area. The responsible FAA official should give attention to lighting systems emitting flashing, “white” light such as strobes. These systems often cause the greatest annoyance to surrounding residents and other light-sensitive areas.

(d) Any measures proposed to minimize light intrusion on nearby residents and light-sensitive sites. Measures include shielding, baffles, making angular adjustments, or other fixes.

(2) **Visual effects.** FAA encourages airport sponsors to consider design arts in a project's preliminary design stage. The environmental document should contain this information to the extent it is available. As practical, highlight design factors that will complement and support establishing functional, efficient, and safe airport operations while meeting local, cultural, and architectural heritage considerations. Examples of design art and architecture at airports include the following measures.

a) Design considerations that would reduce the adverse effects of visual encroachments into residential or recreational areas or that disrupt scenic vistas. Architectural treatments of facilities that reflect light so the light blends in with nearby architectural styles. Painting or shielding structures, such as landing aid supports, reduce visual impact.

(b) Actions involving extensive earthmoving may visually disrupt the landscape. Standard design and engineering principles often lessen erosion or provides acceptable drainage or prevents other landscape effects. Extra care in slope design and plantings (that do not attract hazardous wildlife) would help minimize adverse visual and other environmental effects.

(c) Moving streams or other waters into channels designed to reflect the natural characteristics of the existing stream. This is often more aesthetically pleasing and less costly than installing concrete sluiceways. Bank stabilization with plantings that do not attract hazardous wildlife may improve the appearance of disturbed areas and control erosion.

(d) New facilities or major terminal expansion may provide excellent ways to recognize and reflect an area's notable architectural, cultural, or ethnic assets. Consider these assets when developing outside designs, landscaping, or architectural treatments for facilities or terminals

7. DETERMINING IMPACT SIGNIFICANCE.

a. **General.** In some airport actions, airport lighting or visual effects may disturb natural resources or add unwanted aesthetic effects on man-made, historic, or cultural resources. After completing the analysis discussed in earlier sections of this chapter, apply the following information to determine the degree of effect on nearby residents or other light-sensitive areas or habitats. The visual impact discussion will normally address design, art, architecture, or landscape architecture to mitigate adverse visual effects or encourage enhancement of the environment. Consultation with expertise agencies is important when determining the level of light-related or visual effects. The environmental document should contain a record of any relevant communications.

ORDER 1050.1E THRESHOLD	FACTORS TO CONSIDER
None established.	<p>For light emissions: When an action's light emissions create annoyance to or interfere with normal activities.</p> <p>For visual effects: When consultation with Federal, State, or local agencies, tribes, or the public shows these effects contrast with existing environments and the agencies state the effect is objectionable.</p>

From: Table 7-1, FAA Order 5050.4B.

b. **Mitigation.** During the environmental review process, agencies having jurisdiction or special use expertise on various light-sensitive resources (i.e., natural, man-made, historic, or cultural resources, parklands, etc.) may provide letters addressing lighting or visual effects on those resources. Those letters may include recommended measures to mitigate those effects. An appendix to the environmental document should include copies of those letters. The environmental document should summarize the most important information in those letters and accurately cross-reference the appendix and pages in that appendix for further information. If the FAA or the sponsor does not adopt any recommended mitigation, the environmental document should clearly explain why the recommendation was not adopted. If feasible, provide an estimated schedule for undertaking accepted mitigation.

c. **Examples of mitigation measures.** In addition to the recommendations agencies make, the following mitigation measures may be useful.

(1) **Light emissions.** Potential mitigation may include the following measures to lessen light emissions on surrounding light-sensitive land uses:

- (a) shielding lighting fixtures with top visors;
- (b) angling fixtures toward the base of the mounting poles;
- (c) Directional lighting; or;
- (d) using minimal pole heights or reduced wattage bulbs.

(2) **Visual effects.** FAA encourages airport sponsors to use the principles of good design, art, and architectural treatment to blend airport facilities with surrounding areas. FAA Order 5100.38C, *Airport Improvement Program Handbook*, paragraph 304, provides guidelines for treating and promoting design, art, and architectural objectives in airport aid projects.

8. ENVIRONMENTAL IMPACT STATEMENT CONTENT.

a. **General.** FAA must prepare an EIS if mitigation will not reduce light emissions or visual effects to levels that do not significantly affect man-made, historic, or cultural resources. Further agency consideration may focus on previously unconsidered mitigation measures and alternatives. To avoid repeating information that another section of the EIS provides on light emissions, the EIS Light Emissions section should refer the reader to the chapter(s), if those chapters discuss lighting or visual intrusions on a particular resource. If those chapters do not address those lighting or visual effects, that information must appear in the EIS's Light Emissions chapter.

b. **Light emissions.** It is possible the responsible FAA official will decide that a special lighting study is necessary. The study may be appropriate in locales where high intensity strobe lights shine directly into homes or other sensitive areas or habitats. Those studies should assess lighting systems, alternative light locations, or mitigation measures not considered previously.

c. **Visual effects.** This impact discussion will normally address the use of design, art, architecture, or landscape architecture principles. These principles help lessen project-induced visual effects or enhance the visual environment. The responsible FAA official may encourage, but not require, an airport sponsor to use design, art, or architectural principles to reduce project-related visual effects. Because FAA cannot force the sponsor to do so, the FAA official must discuss the need for more information with the sponsor, when appropriate. The sponsor must agree that more analysis is needed. The responsible FAA official should note extensive, detailed design concepts are not usually developed until the EA or EIS is completed.

d. **Mitigation.** The EIS should describe proposed mitigation when expertise agencies provide that information. FAA and the airport sponsor should fully consider the mitigation and balance its benefits against those of the proposed action.

NEPA requires a Federal agency preparing an EIS to discuss mitigation in sufficient detail to disclose that environmental consequences have been fairly evaluated (*Robertson vs. Methow Valley*, 490 U.S. 332 (1989)). In addition, under 49 USC Section 47106 (c)(1)(B), FAA may not approve a Federal funding for major airport development projects, unless the agency determines that no possible and prudent alternative to the project exists and that every reasonable step has been taken to minimize the adverse effect. Major airport development projects are those that involve the location of a runway, new airport, or major runway extension. For more information about the mitigation required, see FAA Order 5050.4B, paragraph 1203(b)(4). The EIS must discuss and adopt mitigation measures recommended by agencies having expertise in accordance with NEPA and 49 USC Section 47106(c)(1)(B).

If needed, the EIS should explain why the sponsor or FAA did not adopt any mitigation the public agency authorized by the state to plan for the areas surrounding the airport land use agencies recommend. If feasible, provide an estimated schedule for undertaking accepted mitigation.