U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Airport Land Use Compatibility Planning

Date: DRAFT **AC No:** 150/5190-4B

Initiated By: APP-400

1 Purpose.

- This Advisory Circular (AC) is intended to help a broad audience understand the effects of incompatible land use on the safety and utility of airport operations, and identify compatible land use development tools, resources and techniques to protect surrounding communities from adverse effects associated with airport operations.
- This AC describes the major incompatible land uses that conflict with or are impacted by operations at local public-use airports. These include residential use within airport noise contours; airspace obstructions and hazards to safe navigation to and from the airport such as tall structures, light, glare, electronic/radio, smoke or other atmospheric interference emanating from nearby land uses; land uses that attract birds and other wildlife hazards to the airport and its immediate environs; and land uses with concentrations of people or property within airport runway protection zones.
- Airport-compatible land uses are defined as those uses that can coexist with a nearby airport without constraining the safe and efficient operation of the airport, or exposing people living or working nearby to unacceptable levels of noise or hazards.
- The intent of this document is to inform, educate, and increase awareness about land use compatibility issues related to airports and community development. This AC provides broad, general guidance to communities across the country on airport compatible land use planning. Because the Federal Aviation Administration (FAA) does not have the l authority to directly control land uses and land use decisions are often made at the local level, it is important that local land use planners understand the implications of land use compatibility between airports and their local communities. The guidance in this AC does not replace any local land use regulations that may be in place.
- Through federal grant assurances, airport sponsors and owners are obligated to pursue all reasonable and appropriate actions to secure and promote compatible land use and development within their local areas. Airports owned and operated by the same jurisdiction that is the land use authority (e.g. city or county owned airport) are expected to adequately control land use near the airport and prevent new incompatible development. Airports that are located within multiple jurisdictions or have no land use

authority are expected to remain vigilant of incompatible development proposals within the airport environs, and take reasonable and appropriate action to mitigate incompatible land use and promote compatible development.

- Nothing in this AC creates or modifies existing airport planning or design standards, or creates new requirements for airports, communities or FAA personnel. Rather, it consolidates and updates previous guidance on these matters, including information on tools and resources that the FAA has created since the preceding AC was published in 1987.

2 Application.

- This document is intended for a diverse audience. This includes airport sponsors, airport management, developers, local and regional land use planners that are focused on transportation, economic development, natural resource conservation, and related topics; local elected and appointed officials; FAA officials and other governmental agencies (federal, state and local); and others who play a role in achieving and maintaining airport land use compatibility.
- This AC provides resources to assist airport and state and local community planning efforts with the development of effective airport land use compatibility plans. Sample airport land use compatibility plan content, and airport overlay and compatibility zoning ordinances, are included in the AC appendices.
- The information contained in this AC is not all-inclusive. Applicability will vary on a case-by-case basis due to state and local land use planning regulations.
- This AC does not constitute a regulation, and is not legally binding in its own right. It will not be relied upon as a separate basis by the FAA for affirmative enforcement action or penalty. Conformity with this AC is voluntary, and nonconformity will not affect rights and obligations under existing statutes and regulations, except for the projects described in subparagraphs 2 and 3 below:
  1. The standards and processes contained in this AC are specifications the FAA considers essential for the fidelity of Residential Sound Insulation Programs.
  2. Use of these standards and guidelines is mandatory for projects funded under Federal grant assistance programs, including the Airport Improvement Program (AIP). See Grant Assurances #34 and #21.
  3. This AC is mandatory, as required by regulation, for projects funded by the Passenger Facility Charge program. See PFC Assurance #9.

     Note: This AC provides one, but not the only, acceptable means of meeting the requirements of 14 CFR Part 139, Certification of Airports.

3 Cancellation.

This AC cancels AC 150/5190-4A, *A Model Zoning Ordinance to Limit Height of Objects around Airports*, dated December 14, 1987. It also cancels FAA Memorandum, "Interim Guidance on Land Uses Within a Runway Protection Zone," dated September 27, 2012.

4 Feedback on this AC.

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this document.

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CHAPTER 1. INTRODUCTION

1.1 Need for Guidance.

1.1.1 FAA encourages and assists local airport sponsors and their community land use planning authorities with undertaking their best efforts to secure compatible land use development and planning within the airport environs. Airports that accept federal money through the Airport Improvement Program (AIP) must comply with all FAA Grant Assurances. These include but are not limited to Assurances 19, Maintenance and Operation; 20, Hazard Removal and Mitigation; and 21, Compatible Land Use. These assurances are based on statutory requirements. Because these assurances require airports to take appropriate and reasonable actions to promote and maintain airport land use compatibility, the FAA is publishing this Advisory Circular (AC) to provide guidance to airports and other stakeholders on how to accomplish these actions.

1.1.2 Although there are various federal resources on the topic of land use compatibility, historically there is no single, comprehensive land use guidance tool for airports and local communities. This AC is intended to serve as a resource to help airports comply with their grant assurances concerning all the compatible land use issues, including obstructions and hazard to airport navigation, airport noise, wildlife attractants and protection of persons and property on the ground. It references FAA regulations and guidance concerning compatible land use and development within the airport environs, such as Part 77 and Part 150 of Title 14 of the Code of Federal Regulations (CFR) and FAA Advisory Circulars (AC) 150/5300-13, *Airport Design,* and 150/5020-1, *Airport Noise Control and Compatibility Planning for Airports.*

1.1.3 This AC should be used as a starting point in addressing land use compatibility issues. Because land use planning and regulation is a power reserved to the states and political subdivisions of states, readers should refer to appropriate state legislation and guidance before formulating land use compatibility plans and programs. Additionally, local municipalities should review relevant ordinances, and other national and local guidance for a comprehensive understanding of each airport scenario.

1.2 Organization of the AC.

This AC is organized into the following chapters:

- Chapter 1: Introduction – Defines the concept of land use compatibility and its importance.
- Chapter 2: Land Use Compatibility Concerns – Identifies the land uses that may cause concern near airports.
- Chapter 3: Roles and Responsibility of Stakeholders – Addresses the various stakeholders at all levels and their responsibilities in achieving compatible land use.
- Chapter 4: Airport and Local Land Use Planning Coordination – Describes the various methods for planning coordination at the local level.

- Chapter 5: Tools and Techniques for Land Use Compatibility – Provides numerous methods and resources that can be employed to promote and achieve land use compatibility.
- Appendices – Includes additional resources related to airport land use compatibility:
  - Appendix A – Glossary
  - Appendix B – FAA Office of Airports
  - Appendix C – FAA Land Use-Related Regulations and Guidance
  - Appendix D – List of Crops Posing Particular Wildlife Attractant Problems
  - Appendix E – Sample Airport Land Use Compatibility Plan
  - Appendix F – Example Airport Land Use Compatibility Overlay Zoning Ordinance

1.3 History of Land Use Compatibility.

1.3.1 Airport land use compatibility has been a topic of discussion ever since flight began. It was formally recognized as an issue in 1952 when President Harry S. Truman commissioned the development of a report entitled "The Airport and its Neighbors" (commonly known as the Doolittle Report). The Doolittle Report documented the need to protect and preserve airports from incompatible land uses and protect people on the ground within the vicinity of airports from nuisances caused by airport and aircraft operations. Since that publication, guidance documents and programs have been created with the goal of supporting compatible land use near airports. As time has passed and development pressures have increased, the need for planning that addresses noise impacts to homes near airports and airport land use compatibility has grown between the 1960's and the present day.

1.3.2 National guidance on land use has been historically through three primary ACs:

- AC 150/5050-6, *Airport Land Use Compatibility Planning,* published in December 1977 (cancelled);
- AC 150/5020-1, *Noise Control and Compatibility Planning for Airports,* published originally in August 1983 at the initiation of FAA Airport noise compatibility planning programs, see Section 5.4 for description of FAA noise programs under 14 CFR 150; and
- AC 150/5190-4, *A Model Zoning Ordinance to Limit Height of Objects around Airports,* published in December 1987.

1.3.3 This AC supersedes AC 150/5190-4A, which focused primarily on height limitations. This revised AC accounts for both height and broader land use compatibility considerations. Appendix C includes a brief summary of federal land use regulation and guidance.

1.3.4 Other topics (such as wildlife attractants, noise, and airport and airspace design-related issues) are addressed in other FAA documents. This results in airport sponsors and local land use planners cross-referencing a number of resources to obtain a comprehensive picture of the issues related to compatible land use planning.

1.3.5 FAA guidance can help state, county, and local governments improve compatible land use planning. Increasing demand for land use development near airports will continue to impact airport operations and planned development. Consequently, it is important that airport sponsors act proactively with their local communities to promote compatible land use planning. Application of the tools and techniques described in this AC and the referenced FAA directives will help airport sponsors develop the coordinated compatible land use planning methods with their communities.

1.4 Value of Aviation.

1.4.1 The value of the U.S. air transportation network is evident on and off-airport, and at the local, regional, and national levels. Several national studies have been conducted to quantify this value, both directly and indirectly, across the aviation industry. According to the 2016 FAA report, *Economic Impact of Civil Aviation on the U.S. Economy*, civil aviation is responsible for nearly 11 million jobs, with over $446 billion in earnings and $1.6 trillion in total economic activity.

AIRPORT OPERATIONS/ACTIVITIES

Airports support a wealth of operations beyond general leisure and business travel and air cargo movement. Some examples include:

- Remote access
- Medical transport
- Surveillance
- Aerial firefighting
- Law enforcement
- International protection
- Research
- News reporting
- Visitation by VIP

1.4.2 The economic impact of airports in the U.S. was evaluated in Airport Cooperative Research Program (ACRP) Report 138, *The Role of U.S. Airports in the National Economy*. According to the report, airports directly support over two million jobs that total nearly $148 billion in labor income. When multiplier effects are considered, U.S. airports support $768 billion in total value added to the national economy.

1.4.3 In 2013, the General Aviation Manufacturers Association (GAMA) commissioned an economic study on the value of general aviation (GA) in the U.S. entitled *Contributions of General Aviation to the U.S. Economy*. This study found that GA supports 1.1 million jobs, with $69 billion in labor income and $219 billion in national economic output.

1.4.4 In addition to the economic value, airports provide qualitative benefits to a local community. This includes efficient trade, tourism accessibility, transportation safety, and expanded national and global health and research resources.

1.4.5 While the value of aviation can be evaluated in a number of ways (quantitatively and qualitatively), it is clear that the aviation system within the U.S. is significant to economies and communities at the local, regional, and national levels.

1.5 Benefits of Compatible Land Use Planning.

1.5.1 Compatible land use planning can benefit both the airport and the local community. While the benefits of compatible land uses are the same whether development exists or not, the cost of eliminating incompatible uses is much greater than the cost of effective, coordinated planning to prevent incompatible uses in the first place. Many stakeholders outside of airport property benefit from these planning efforts. The FAA encourages local communities/municipalities to consider these benefits when assessing the value of compatible land use planning.

1.5.2 Benefits range from continued value of the transportation infrastructure and transportation system, to continued support for business, leisure travel, and tourism, to reduction in noise-sensitive uses near airports, among many others. These benefits are recognized at all levels (local, regional, statewide, and national) and by many interest groups. Discussion of compatibility planning benefits is divided into the following sections:

- Benefits to the aviation system
- Benefits to people near airports
- Benefits to local and regional jurisdictions

1.5.3 Benefits to the Aviation System.

The opportunity for increased development, both on and near an airport, can benefit an airport and the local community financially. Likewise, protecting an airport's approaches and complying with design standards provides clear operating areas for aircraft utilizing an airport.

1.5.3.1 Opportunities for Airport Development.

Planning for compatible development can provide more opportunities for the efficient development of on-airport property (both aeronautical and revenue producing) and expansion of airport facilities. When incompatible uses are developed near airports, the airport may not be able to expand to meet increasing airport user needs or take advantage of beneficial on-airport development. Mitigating these incompatible developments after the fact to make room for an airport expansion can be extremely expensive. Instead, airport sponsors are urged to work proactively with local jurisdictions to plan for the airport's future development needs by identifying (early in the planning process) land use patterns and growth that are compatible with both current and anticipated airport use and local community needs.

1.5.3.2 **Preservation of Airport and Aircraft Operations.**

1.5.3.2.1 Incompatible land use has the potential to impact airports and aircraft operations in several negative ways. Not only does it raise concerns regarding potential aircraft accidents, incompatible land uses can limit the functionality and utility of an airport. For example, incompatible land uses, such as structures, that encroach into protected airspace may eventually cause displacement of a runway's threshold in order to maintain safety margins. A displaced threshold shortens the usable length of the runway and therefore limits the types of aircraft that can operate on a runway.

1.5.3.2.2 In addition to preserving airport facilities, encouraging the development of compatible uses at and around an airport can eliminate or reduce the need for pilots to follow modified flight paths or other costly noise abatement procedures if nearby development is in noise-sensitive areas.

1.5.3.3 **Protection of Airport Approaches and Departures.**

The most critical areas surrounding an airport are the approach and departure zones for airport runways. Because aircraft landing or departing from an airport frequently occupy this airspace, it is important to assess land uses directly underneath these zones for compatibility with aircraft operations. Continually monitoring and evaluating land uses in these areas can ensure the airport continues to operate safely and efficiently.

1.5.3.4 **Reduced Potential for Litigation.**

1.5.3.4.1 Another benefit of compatibility planning is a reduced potential for litigation. Litigation that stems from land use compatibility issues can be costly for all parties involved, including an airport's sponsor (which is often the local municipality). If airport administration/management makes diligent efforts to encourage a compatible environment (existing and future), the risk of entering litigation to resist or prevent land use incompatibility can be significantly reduced. Coordinated airport and land use compatibility planning works to prevent potential site development conflicts that could otherwise result in costly and wasteful litigation to prevent incompatible development.

1.5.3.4.2 In general, airport sponsors may expect litigation costs to include attorney's fees, staff time, and the amount of settlement (if any). The magnitude of costs depends upon the type of litigation, duration and outcome, and can vary drastically from one scenario to the next. Case studies in ACRP Report 27 indicate there have been cases that have cost thousands of dollars on the low-end to millions of dollars on the high-end.

311 1.5.3.5 **Compliance with Airport Design Standards.**

312 1.5.3.5.1 Encouraging compatible uses near an airport can help provide or protect
313 runways of the appropriate dimensions for use by the most critical aircraft.
314 Airport design standards are addressed in FAA AC 150/5300-13, *Airport*
315 *Design.* These should be considered when looking at compatible land use
316 issues. When incompatible development surrounds an airport, it can be
317 challenging for the airport sponsor to provide a runway that complies with
318 airport design safety standards.

319 1.5.3.5.2 Sponsor implementation of compatible land use controls and monitoring for
320 incompatible development will help mitigate and prevent hazards to flight.
321 It will also help protect people and property on the ground near airport
322 runways.

323 1.5.3.6 **Avoidance of Hazardous Wildlife Attractants.**

324 1.5.3.6.1 FAA AC 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports,*
325 advises that specific land use developments such as wastewater treatment
326 facilities, wetlands mitigation, dredge spoil containment areas, and solid
327 waste landfills be located at least 5,000 feet away from the end of a runway
328 at an airport that primarily serves piston-type aircraft, and at least 10,000
329 feet away if the airport serves turbojet aircraft. Airport sponsors who are
330 actively involved with their local planning entity are more likely to be
331 aware of proposals for these types of uses, and can work to maintain
332 compliance with AC 150/5200-33 and applicable regulations. See Section
333 2.2.3 for a discussion of the land use location and land use characteristics
334 that contribute to wildlife attractant hazard conditions, and require sponsor
335 evaluation and actions to prevent or mitigate hazards.

336 1.5.3.6.2 Not only do wildlife strikes pose a risk to aircraft occupants and people on
337 the ground, they are almost always fatal to the wildlife. Because of this,
338 land use compatibility planning can also protect wildlife by encouraging
339 habitat preservation or development away from airports.

340 1.5.4 Benefits to People near Airports.

341 An efficient airport contributes to the well-being of the public it serves, both
342 economically and by providing essential and desired aviation services. The benefits of
343 land use compatibility planning extend beyond an airport's property line and into the
344 surrounding community. Compatible land uses protect the people who live and work
345 near the airport by moderating potential effects whenever possible. Using the tools in
346 this AC and referenced resources, airports and local jurisdictions can evaluate land use
347 compatibility on an individual basis.

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1.5.4.1 **Community Awareness of Airport Compatible Land Use Planning.**

1.5.4.1.1 To fully realize the benefits of compatible land use planning, the local community needs to understand the concept of compatibility. Raising awareness in the local community about the effects of incompatibility and the benefits of compatibility can foster a collaborative relationship between the community and the airport in which thoughts and concerns from both perspectives are shared.

1.5.4.1.2 This can be accomplished in many ways, such as hosting an open house at the airport or airing a short educational segment on airport/local community social media outlets. Communities that understand the reasons for compatibility planning are more likely to be supportive of compatible land use planning efforts in the future.

1.5.4.1.3 Federally obligated airports should work with the FAA to ensure any outreach they conduct is within their grant obligations (e.g. acceptable airport revenue use practices).

1.5.4.2 **Reduced Noise Exposure.**

Planning that reduces or prevents noise-sensitive uses around an airport benefits the community by reducing the number of people exposed to aircraft noise and by improving the quality of life for nearby residents. When noise-sensitive uses already exist around an airport, techniques such as noise abatement and noise mitigation can help reduce the effects of airport noise. 14 Code of Federal Regulations (CFR) Part 150, *Airport Noise Compatibility Planning* and FAA AC 150/5020-1 also provide valuable guidance and resources. See Section 2.2.1 of this AC for more information on airport noise compatibility programs.

1.5.4.3 **Opportunities for Compatible Community Development.**

Collaboration between airports, local jurisdictions, and private property owners/developers during long-term planning can identify compatible uses that support economic development on and around an airport. By keeping compatibility concerns in mind during planning phases, stakeholders can be more confident about proposed investment and development, and avoid costly investment in incompatible uses.

1.5.5 Benefits to Local and Regional Jurisdictions.

1.5.5.1 Local and regional jurisdictions are often the owners and sponsors of public airports. Therefore, they have a responsibility to maintain compatibility between the airport and the local community. Coordinated land use compatibility planning greatly benefits local and regional jurisdictions over the long-term. Developing the needed coordination structures and relationships can be challenging, and may require several years of continued

effort, but it can result in mutually desired compatible land use plans and development results.

1.5.5.2 An example of compatibility planning benefits at the local and regional level is in Panama City, Florida, with the construction of the Northwest Florida Beaches International Airport (ECP). This airport replaced the former Bay County International Airport.

1.5.5.2.1 The new airport and redevelopment of the closed airport was planned jointly by the State of Florida Department of Community Affairs (DCA), Bay County, and the Panama City – Bay County Airport Authority and Industrial District (Airport Authority). The new airport location was largely undeveloped. These entities developed a new land use sector plan to identify the location of planned airport infrastructure and defined an Airfield Compatibility Use Special Treatment Zone (ACUSTZ) around the airport. Under the land use sector plan, incompatible uses (according to FAA criteria) are located outside of the defined ACUSTZ.

1.5.5.2.2 Stakeholder efforts (especially the Airport Authority, in cooperation with the state and local jurisdictions) resulted in a coordinated land use plan and framework for development that meets the community's vision and protects the new airport for planned operations to serve the community.

1.5.5.3 Compatible land use planning at existing airport locations also greatly benefits the local community and their airport facilities. Zoning and development permitting and planning that precludes introduction of incompatible development provides long-term benefits and cost savings to a community (versus the cost of incompatible development). To secure these benefits, airports that are owned by the local land use jurisdiction should ensure effective land use controls are enforced within the airport environs under their jurisdiction. The FAA encourages airports without land use authority within the airport environs to remain vigilant and advocate for compatible development and land use controls whenever opportunities arise.

1.5.5.3.1 Reduced Potential for Complaints.

Compatibility planning to minimize noise-sensitive uses near airports is the most effective way to reduce complaints from the local community. Planning for mitigation or prevention of noise sensitive uses is the key consideration for effective coordinated land use planning. This applies to both airport development and off-airport land uses in areas affected by aircraft noise.

1.5.5.3.2 Development Revenues and Taxes.

In many instances, compatible land uses provide higher property tax payments and demand fewer services. For example, industrial uses often have a higher tax rate than residential uses. Open space and agricultural

uses demand fewer services (subject to wildlife attractant evaluation). Evaluation of potential land use options may create a potential win-win situation where development is both more compatible and lucrative for the local municipality. Airport compatibility planning can encourage this kind of development. It can also reduce the potential that infrastructure investment may not be usable when land use compatibility is ultimately considered.

1.5.5.3.3 Reduced Mitigation Cost for Incompatible Development.

- It is usually less costly for local jurisdictions to plan and prevent the development of incompatible land uses than to mitigate problems later. Airport owners and operators, as well as other jurisdictions, can be held liable, directly or indirectly, for at least a portion of mitigation costs stemming from effects of incompatible land uses near the airport.
- ACRP Report 27, *Enhancing Airport Land Use Compatibility*, explored the impact of mitigation measures on local municipalities/entities/airports through several case studies. In some cases, airports proposed strategies to reduce hours of operation as a mitigation effort to reduce noise impacts. However, the impact on the economic viability of the airport by limiting its utility may not be acceptable. There are also legal impediments to outright restrictions for federally obligated airports. Other airports (such as the Fort Lauderdale Executive Airport in Ft. Lauderdale, Florida) have implemented preferential runway and flight track use to move noisy operations away from the most noise-sensitive areas, which can also limit airport utility.
- In other cases, airports (such as the Indianapolis International Airport) have implemented noise compatibility programs that include mitigation such as sales assistance, sound insulation, land acquisition, and other measures to mitigate incompatible development.
- In conclusion, when incompatible development is not prevented, higher costs are being incurred locally: (1) for property acquisition and other mitigation measures, (2) due to reduced tax revenue from devalued incompatible land use, and (3) local economic impacts due to reduced airport utility and efficiency.

1.6 Consequences of Incompatible Development.

1.6.1 Incompatible land uses such as those that pose physical obstructions, create visual distractions, and attract wildlife can threaten the safety of aircraft operations. They can also affect the safety of persons located near the airport environs. In addition, encroachment of incompatible land uses around airports may create physical constraints to safe and efficient aircraft operations, and challenges for airport capacity expansion.

1.6.2 The effects of airport operations on incompatible land uses—especially noise impacts on residential areas—can create a negative perception of the airport in the local community. Airport operations can be perceived as generating negative effects on the local community, especially noise disturbances on incompatible land uses. Community opposition generated by off-site airport effects can:

- Lead to delays in airport development or require redevelopment;
- Constrain capacity expansion;
- Restrict airport operations;
- Result in more stringent environmental requirements (including greater environmental impact analysis and mitigation requirements);
- Increase public outreach requirements; and
- In some cases, lead to litigation.

1.6.3 From a broader perspective, according to the U.S. Government Accountability Office (GAO), "constraints on efforts to expand airports or aviation operations could affect the future of aviation because the national airspace system cannot expand as planned without a significant increase in airport capacity." The national aviation system cannot accommodate the projected doubling or tripling of air traffic in the coming decades without additional airports and runways (GAO, 2008). This broader perspective, combined with the local community effects, demonstrates the wide range of potential impacts of incompatible development on the national, regional, and local economy, as well as neighbors to individual airports across the country.

1.6.4 On-Airport Economic Considerations.

When incompatible land uses result in community opposition to airport operation and expansion, there are economic consequences, such as project delays, which may result in additional costs to implement a project. For example, a delayed capacity expansion project leads to a variety of costly outcomes. These include persistent aircraft delays; diversion of aircraft to other airports; or, in extreme cases, the need to build a replacement airport at another site.

1.6.5 Off-Airport Economic Considerations.

1.6.5.1 Airports are local economic engines. They stimulate local economic activity, create employment, and generate income for local residents. When incompatible land uses around airports constrain airport use and efficient air service, local and regional jurisdictions cannot realize the full potential of airports to generate positive regional economic impacts. In addition, incompatible land use development can increase the risk of exposure to aviation accidents and expose neighboring residents to adverse

environmental effects. These impacts are another cost of incompatible land uses near airports.

1.6.5.2 Coordinated compatible land use planning on the airport and in the airport environs seeks to balance development demands to optimize the benefit of the airport location to the community, and preclude hazards and adverse impacts of incompatible development on local airport and aviation facilities.

CHAPTER 2. LAND USE COMPATIBILITY CONCERNS

2.1 Definition of Compatible Land Use.

Airport-compatible land uses are those that can coexist with a nearby airport without constraining the safe and efficient operation of the airport, or exposing people living or working nearby to significant noise impacts of hazards. Occasionally, a land use may not be easily classified by type as compatible or incompatible. It may need to be more closely evaluated on a case-by-case basis. Although this chapter outlines the general characteristics of land uses that influence compatibility, individual state, regional, and local sources should be consulted. Various municipalities have adopted guidance that may provide more specific detail on airport land use compatibility issues.

2.2 Evaluation of Airport Land Use Compatibility.

There are five base characteristics (or areas of consideration) to evaluate when assessing the compatibility of a specific land use. These include aircraft noise, airspace, wildlife, visual/atmospheric interference, protection of people and property, and development density. In addition to assessing a land use against these base characteristics, state and local criteria (if applicable) need to be considered when addressing land use compatibility. Because the FAA has a limited regulatory role in land use planning, the local, regional, and state provisions will likely take precedence in local land use decision making.

2.2.1 Aircraft Noise.

2.2.1.1 Aircraft noise is a primary concern when addressing airport land use compatibility. Aircraft operations can create sound levels that produce noise-induced annoyance in communities near airports, as well as specific effects such as speech interference and sleep disturbance. A tremendous amount of research has been done on this topic within FAA and in the aviation industry.[1] For example, there are numerous ACRP reports such as the following that can provide additional information on aircraft noise:

- ACRP Report 27: *Enhancing Airport Land Use Compatibility*
- ACRP 11-01/Topic 01-05 Legal Research Digest 5: *Responsibility for Implementation and Enforcement of Airport Land-Use Zoning Restrictions*
- ACRP 11-01/Topic 03-01 Legal Research Digest 12: *Fair Disclosure of Airport Impacts in Real Estate Transfers*

[1] As of the date of publication of this draft Advisory Circular, the FAA is actively conducting research to evaluate whether there is a scientific basis for updating the current threshold for defining significant noise. The FAA is also conducting research on sleep disturbance and other aspects of how noise may affect communities.

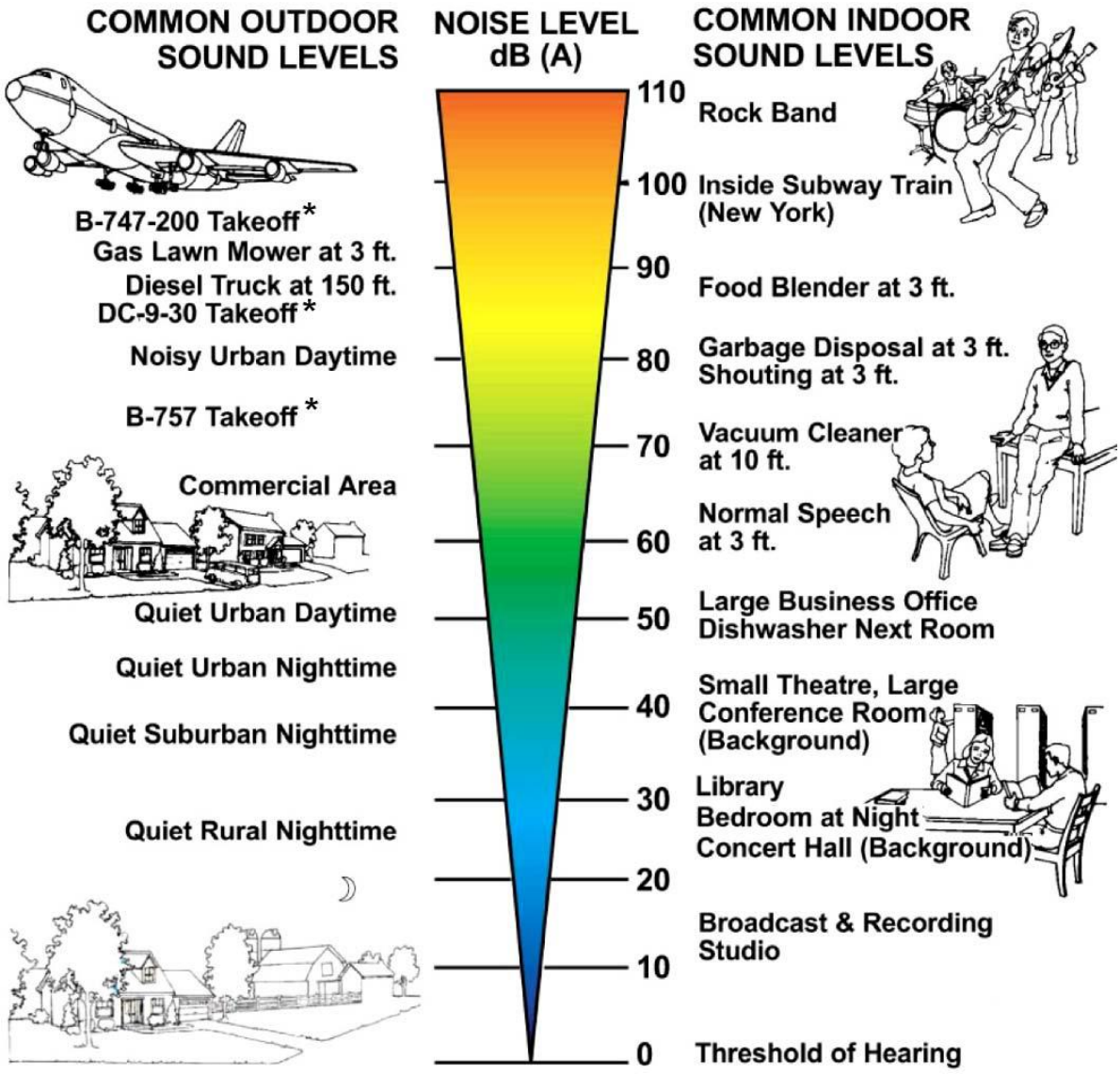
2.2.1.2 Several factors influence the perceived noise impact of aircraft operations near an airport. Common factors include:

- Proximity of a land use to an airport's flight patterns;
- Residents/occupants noise sensitivity: noise annoyance and interference to daytime and nighttime activities;
- Building materials used to reduce interior noise levels;
- The surrounding environment ambient noise level;
- Perception and acceptance of the necessity of existing aircraft noise;
- The typical day/night hours of aircraft operations;
- The number and frequency of aircraft operations; and
- The type of aircraft using an airport.

2.2.1.3 Aircraft noise effects are of concern as they can affect the quality of life for residents in their homes, and affect those using or residing in noise-sensitive facilities near airports. These include schools, places of worship, hospitals, parks, and recreational facilities.

2.2.1.4 **Figure 2-1** illustrates the noise level (dB(A)) of some common indoor noise sources, and how they compare to common outdoor sound levels.

Figure 2-1. Noise Level of Common Sounds



* 2 Miles from Brake Release

Source: FAA

2.2.1.5 As described in 14 CFR Part 150, *Airport Noise Compatibility Planning*, exterior noise levels at or above Day-Night Average Sound Level (DNL) 65 decibels (dB) are considered incompatible with residences and some other noise sensitive land use. **Table 2-1** shows land use compatibility with aircraft noise located within a range of decibel dB DNL measured noise levels. For more information on the compatibility of specific land uses with various levels of aircraft noise, refer to 14 CFR Part 150. In addition, see Section 4.2.2 for further discussion of FAA supported airport noise compatibility programs (NCP) developed under 14 CFR Part 150.

Table 2-1. Land Use Compatibility with Yearly Day-Night Average Sound Levels (DNL)

	Yearly Day-Night Average Sound Level (DNL) in Decibels					
Land Use	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, & concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale/Retail -bldg matrls/hardware/farm equip.	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade – general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing & Production						
Manufacturing – general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agricultural (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Note: The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key: Y (yes) = Land use and related structures compatible without restrictions.
N (no) = Land use and related structures are not compatible and should be prohibited.
25, 30, 35 = Land use and related structures generally compatible; measures to achieve Noise Level Reduction of 25, 30, 35 dB must be incorporated into design and construction of structure.

Notes:

(1) = Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problem.

(2) = Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) = Measures to achieve NLR 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) = Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(5) = Land use compatibility provided special sound reinforcement systems are installed.

(6) = Residential buildings require an NRL of 25 dB.

(7) = Residential buildings require an NRL of 30 dB.

(8) = Residential building not permitted.

Source: 14 CFR Part 150, Appendix A, Table 1 (as published in 1984).

2.2.2 Airspace.

2.2.2.1 The most common airport land use compatibility concerns are the need to: maintain unobstructed space for aircraft to maneuver above ground; protect; navigational facilities; and protect of existing and future airport capacity. Airspace can be physically obstructed by tall structures and vegetation; visually obstructed by glare, light emissions, dust, smoke, etc.; and atmospherically disrupted by thermal plumes.

2.2.2.2 The following sections discuss these airspace issues and the applicable standards and regulations that protect the nation's airspace. Appendix C includes a detailed description of land use guidance resources and applicable regulations, some of which are specific to airspace protection.

2.2.2.3 Structure Height – 14 CFR Part 77/Obstruction Evaluation (OE) Processes and Surfaces**.**

2.2.2.3.1 The FAA has a system of standards and notification procedures to protect the national airspace from physical obstructions. 14 CFR Part 77, "Safe, Efficient Use and Preservation of Navigable Airspace," establishes standards for determining and defining objects that may pose potential obstructions to air navigation. While design standards contained in AC 150/5300-13, *Airport Design*, are intended to protect specific ground areas, 14 CFR

AIRSPACE TERMS

Approach Minimum: The height above ground at which a pilot must have the airfield in sight to continue on approach to land. When obstructions exist to runway approaches, the approach minimums are raised, which can limit the utility of the airport in times of reduced visibility or low cloud cover.

Hazard: An existing or proposed object that the FAA, as a result of an aeronautical study, determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities, or existing or potential airport capacity.

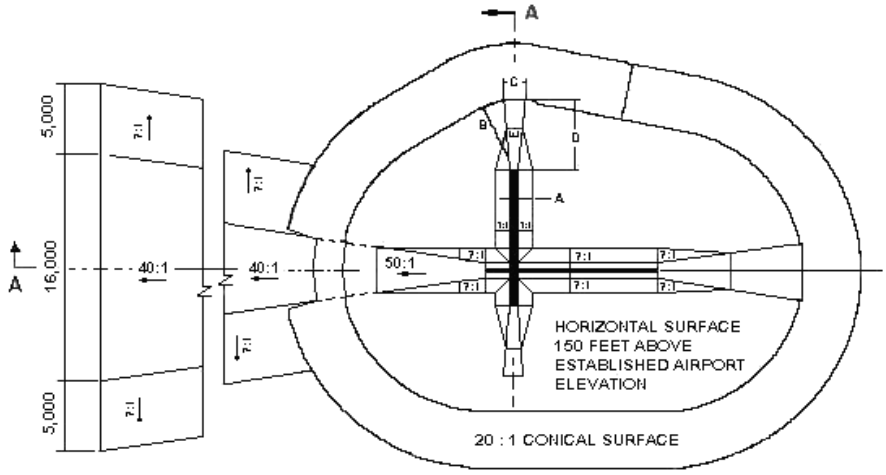
Imaginary Surfaces: Three-dimensional airspace areas that surround a runway and are used by the FAA through 14 CFR Part 77 to evaluate whether a structure or vegetation is or could be a hazard to air navigation. The dimensions of the imaginary surfaces are dependent upon individual runway characteristics.

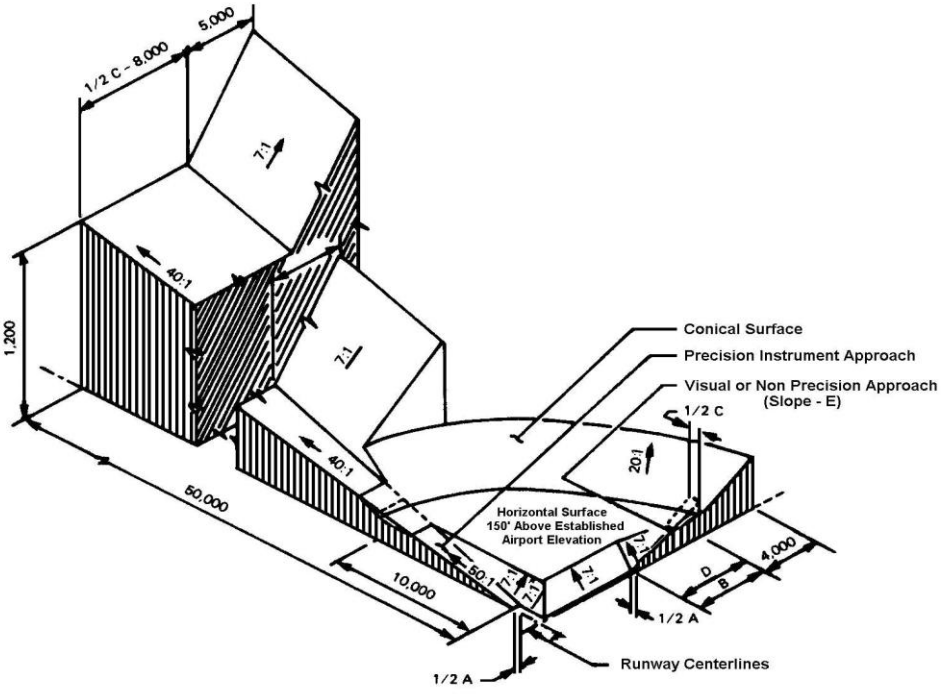
Obstacle: An existing object at a fixed geographical location or which may be expected at a fixed location within a prescribed area with reference to which vertical clearance is or must be provided during flight operation.

Obstruction: An object of greater height than any of the heights or surfaces presented in Subpart C of 14 CFR Part 77, Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities.

Part 77 was developed by the FAA to protect specific airspace areas near an airport. The airspace areas governed by 14 CFR Part 77 are called "imaginary surfaces." **Figure 2-2** illustrates the imaginary surfaces in plan and isometric views.

Figure 2.2 Part 77 Imaginary Surfaces





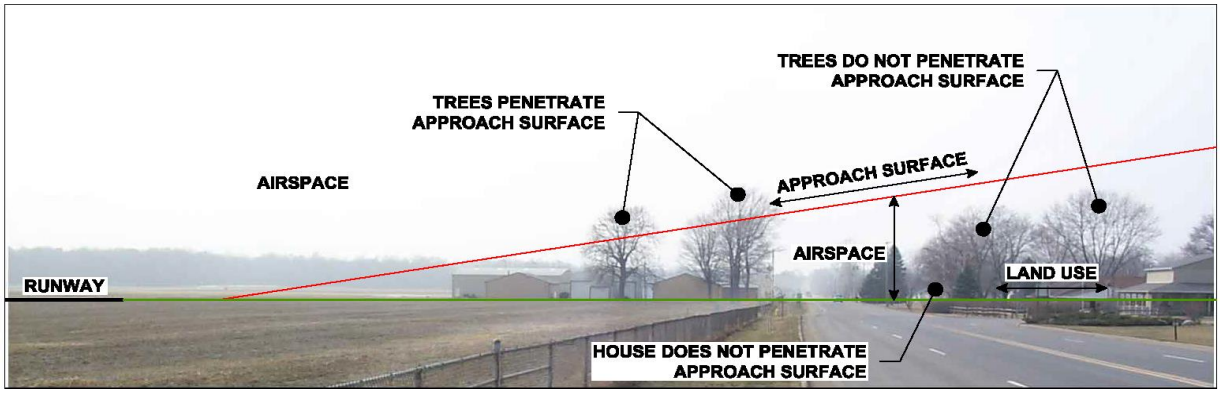
Source: https://www.ngs.noaa.gov/AERO/oisspec.html

2.2.2.3.2 When objects (existing or proposed) such as structures or vegetation penetrate the imaginary surfaces, they are considered "obstructions" to air navigation. The FAA has the authority to evaluate obstructions to determine whether they are or could be a "hazard" to air navigation. Federal airport grant assurances require the airport owner/sponsor to take all reasonable actions to remove, mitigate and prevent the introduction of obstructions to airport navigation approaches.

2.2.2.3.3 The presence of tall structures near an airport may be a hazard to air navigation. Tall structures include man-made objects (such as buildings, cell/radio/TV/MET towers, and wind farms), natural objects (such as tall trees), and terrain (high ground in airport approaches). Tall structures can reduce the utility of an airport and increase the chances of an aircraft collision with the structures. Aircraft approaching an airport under instrument flight conditions (periods of low visibility, such as nighttime or low cloud ceilings) follow a defined set of flight procedures. The height of objects along a runway approach course and in the missed approach segment has a direct effect on these procedures. **Figure 2-3** illustrates tall trees that are penetrating a runway approach surface (specific surface as defined by FAA AC 150-5300-13). A tall structure obstruction to airspace may prompt an increase in the minimum visibility and cloud ceiling criteria that a pilot must follow. These changes may increase the likelihood that aircraft will not be able to land at an airport during inclement weather.

2.2.2.3.4 In **Figure 2-3**, the tall trees must be trimmed or removed to maintain a clear runway approach. Unmitigated hazards may raise the runway approach minimums, resulting in the reduced utility and use of the affected runway.

Figure 2-3. Penetration of an Approach Surface by Tall Trees



2.2.2.3.5 Pursuant to 14 CFR Part 77, proponents of various construction and site alteration projects, on or off airport, must file notice with FAA to determine if the proposed construction or alteration creates a hazard to air navigation.

2.2.2.3.6 During Airport Layout Plan (ALP) review processes, FAA reviews and approves proposed development and construction on federally obligated airports that the FAA finds would materially impact the safe and efficient operation of aircraft at, to, or from the airport or that would adversely affect the safety of people or property on the ground adjacent to the airport as a result of aircraft operations, or that would adversely affect the value of prior federal investments to a significant extent.

2.2.2.3.7 For proposed development off airport property, and for proposed development on airport property that does not fall within the FAA's ALP approval or other regulatory authority, FAA does not approve or disapprove the construction of a structure. Rather, FAA comments on the possible impact to the national airspace system. As required by 14 CFR Part 77.9, "Construction or alteration requiring notice," any person or organization who intends to sponsor construction or alterations listed below must notify the FAA for an FAA obstruction evaluation.

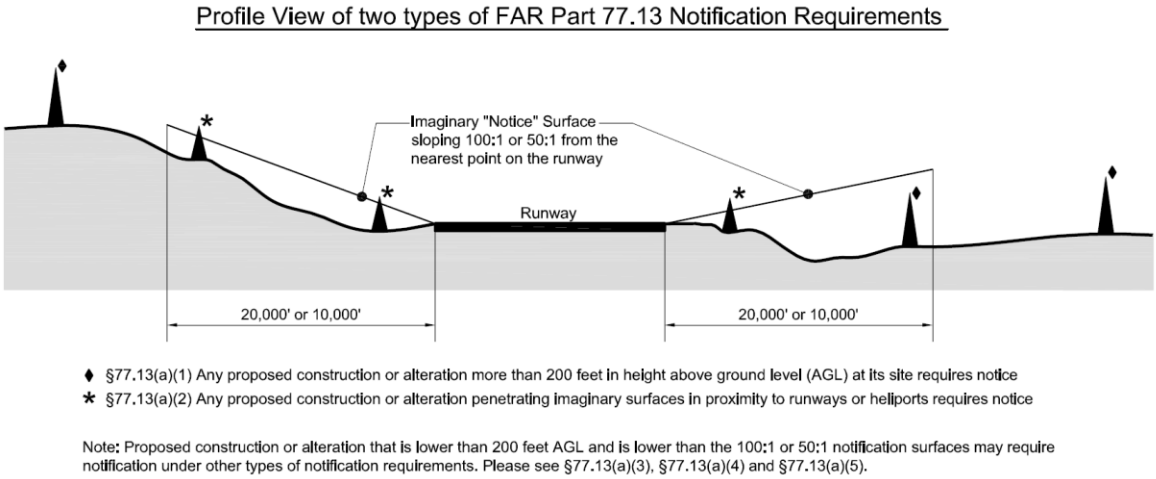
- Any construction or alteration that is more than 200 feet above ground level (AGL), regardless of location.
- Any construction or alteration that exceeds an imaginary surface extending outward and upward at any of the following slopes:
  - Penetrates a 100-to-1 slope for a horizontal distance of 20,000 ft. from the nearest point of the nearest runway of each airport described in 14 CFR Part 77. 9(d), with its longest runway more than 3,200 ft. in actual length, excluding heliports.
  - Penetrates a 50-to-1 slope for a horizontal distance of 10,000 ft. from the nearest point of the nearest runway of each airport subject to notice described in 14 CFR Part 77.9(d), with its longest runway no more than 3,200 ft. in actual length, excluding heliports.
  - Penetrates a 25-to-1 slope for a horizontal distance of 5,000 ft. from the nearest point of the nearest landing and takeoff area of each heliport described in 14 CFR Part 77.9(d).
- Any highway, railroad, or other traverse way for mobile objects, of a height which, if adjusted:
  - Upward 17 feet for an Interstate Highway that is part of the National System of Interstate and Defense Highways where overcrossings are designed for a minimum of 17 feet vertical distance;
  - Upward 15 feet for any other public roadway;
  - Upward 10 feet or the height of the highest mobile object that would normally traverse the road, whichever is greater, for a private road;
  - Upward 23 feet for a railroad;

- For a waterway or any other traverse way not previously mentioned, an amount equal to the height of the highest mobile object that would normally traverse it; and
- Would exceed the standard of the first two bullets, above.

- Any construction or alteration on any of the following airports and heliports:
  - A public use airport listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications;
  - A military airport under construction, or an airport under construction that will be available for public use;
  - An airport operated by a federal agency or the DOD; and
  - An airport or heliport with at least one FAA-approved instrument approach procedure.

2.2.2.3.8 **Figure 2-4** illustrates two instances where 14 CFR Part 77 notification is required to allow the FAA to make a determination as to whether the proposed construction or alteration would create a hazard to air navigation.

Figure 2-4. Profile View of Sample Instances Requiring 14 CFR Part 77 Notification



Source: ACRP Report 38, *Understanding Airspace, Objects, and Their Effects on Airports.*

2.2.2.3.9 The FAA launched a notice criteria tool (https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm) that allows the user (airport sponsor, developer, and local municipality) to input locational and dimensional information about a proposed development to determine if they are required to file notice with FAA. If a notice is

required, the proponent will submit FAA Form 7460, "Notice of Construction or Alteration," to FAA for review.

2.2.2.3.10 In addition to evaluation of the imaginary surfaces in 14 CFR Part 77, airport and aircraft operators also consider whether obstructions exist to the airspace surfaces created by Terminal Instrument Procedures (TERPS) and one-engine inoperative (OEI) obstacle identification surface (OIS). More detail on TERPS and OIS is in Section 2.2.2.4 and Section 2.2.2.5, respectively.

2.2.2.3.11 The FAA evaluation usually results in one of three determinations on proposed construction:

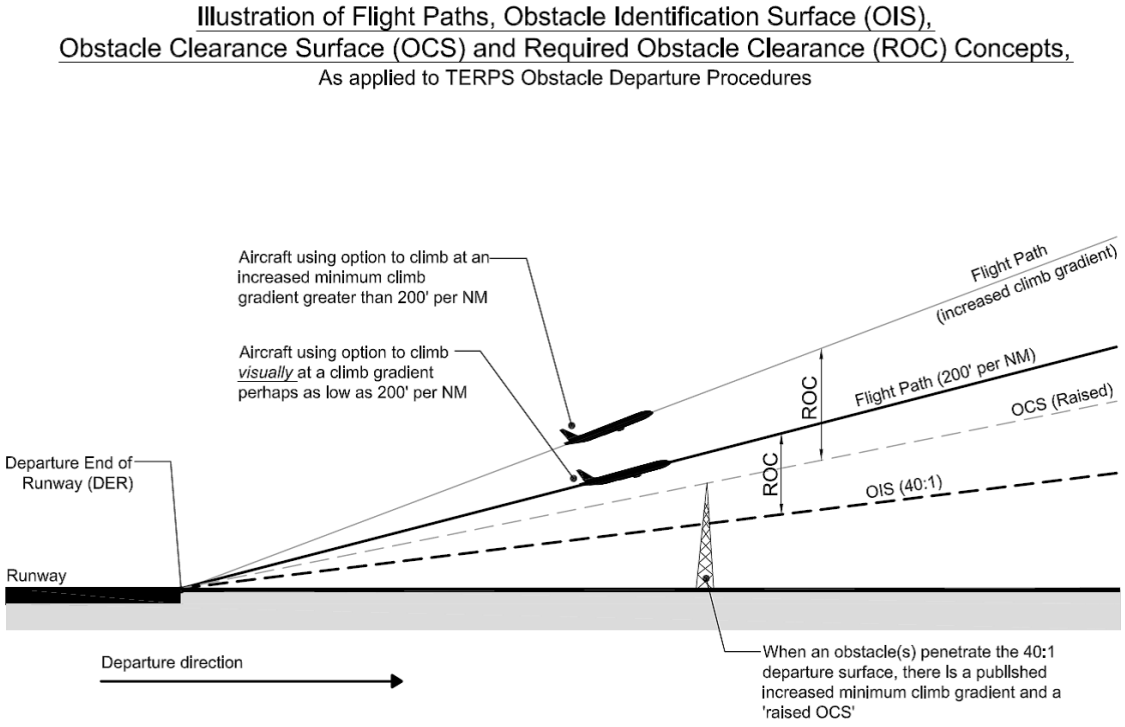
- Determined to be a hazard to air navigation;
- Determined not to be a hazard to air navigation; or
- Determined not to be a hazard with certain mitigation measures, such as lighting or marking.

2.2.2.3.12 As stated, though developers must submit FAA Form 7460, FAA does not have the authority to stop off-airport construction. Therefore, it is critical for local communities to create the height restrictions that prevent and/or mitigate structures that could be obstructions or hazards to air navigation.

2.2.2.4 Structure Height – Terminal Instrument Procedures (TERPS)**.**

FAA Order 8260.3, "United States Standard for Terminal Instrument Procedures (TERPS)," contains standards for designing and evaluating terminal instrument procedures at any location over which the U.S. has jurisdiction. TERPS criteria are used primarily by FAA when developing instrument flight procedures. Similar to 14 CFR Part 77, TERPS places constraints on the airspace in the vicinity of an airport. This may impact which land uses are compatible beneath those surfaces. TERPS surfaces are generally lower than 14 CFR Part 77 surfaces along the runway approaches, but may extend farther from the airport (e.g. 10 nautical miles compared to 10,000 feet). Operational TERPS surfaces will be modified due to alterations in the design of a flight procedure or because of the construction of new obstacles. TERPS criteria are designed to provide a margin of safety – a required obstacle clearance (ROC) – between aircraft in flight and permanent objects such as vegetation, terrain, and man-made objects. TERPS operational surfaces always must be clear of and above obstructions. **Figure 2-5** illustrates flight path modifications as applied to TERPS.

Figure 2-5. Flight Path Modifications as Applied to TERPS



Source: ACRP Report 38, *Understanding Airspace, Objects, and Their Effects on Airports.*

2.2.2.5 Structure Height – One-Engine Inoperative Obstacle Identification Surface (OIS)**.**

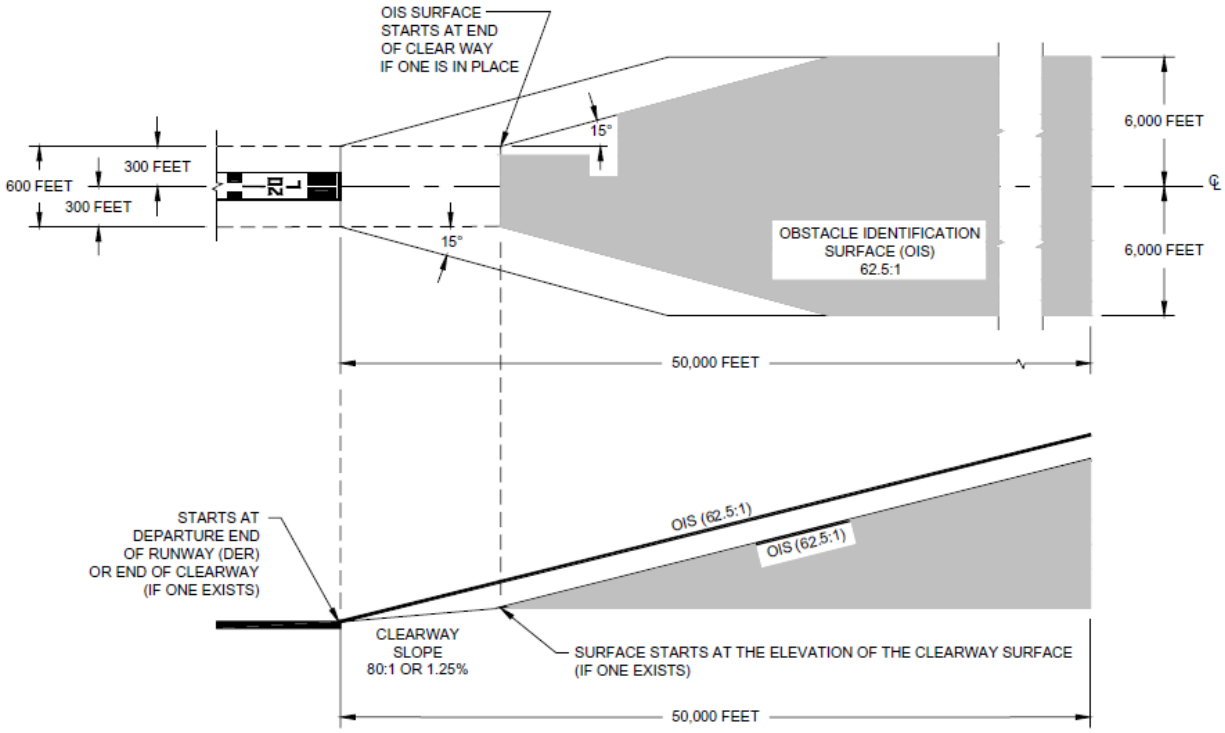
2.2.2.5.1 A two-engine Transport Category Aircraft must be able to climb at a slope of 62.5 feet horizontally to 1 foot vertically (62.5:1) with one engine inoperative in order to receive its FAA operating certificate (see 14 CFR §§25.111 and 25.115). This requirement is the basis for the one-engine inoperative (OEI) obstacle identification surface (OIS).

2.2.2.5.2 The OIS is a departure surface that is used by airlines when planning takeoff weights to avoid obstacles. Pursuant to 14 CFR §§121.189 and §135.379, each airline must calculate the appropriate OIS for individual aircraft operating at specific airports. Airports with runways that support air carrier operations must identify the OIS departure surfaces. These begin at the runway/clearway end at a width of 600 feet, and extend at a slope of 62.5:1 for a horizontal distance of 50,000 feet, with an outer width of 12,000 feet. The OIS is much larger than the surfaces established in 14 CFR Part 77 and TERPS, as illustrated in **Figure 2-6**. Airlines are notified of any object that penetrates the OIS for flight planning purposes.

2.2.2.5.3 Because the OIS is much larger than 14 CFR Part 77 and TERPS imaginary surfaces, it is difficult to coordinate the potential effects to airspace and airport operations if an obstruction exists. Although FAA does not have a

direct role in the protection of the OEI OIS airspace, protection of this airspace can be critical to preserve the viability of commercial air service at airports. Therefore, airport owners/sponsors and land use authorities need to consider it when evaluating compatible land uses near airports.

Figure 2-6. One Engine Inoperative (OEI) Obstacle Identification Surface (OIS)



Source: ACRP Report 38, *Understanding Airspace, Objects, and Their Effects on Airports.*

2.2.2.6 New Airports/Landing Fields**.**

2.2.2.6.1 The airport owner/sponsor needs to consider and evaluate potential local land use impacts when planning and developing a new airport.

2.2.2.6.2 Form 7480-1, "Notice of Landing Area Proposal[2]," works in conjunction with 14 CFR Part 157, *Notice of Construction, Alteration, Activation and Deactivation* to identify potential incompatibility. The regulation requires notification to the FAA 90-days prior to constructing or establishing a new airport (along with construction, alteration, deactivation, or change to the use of an existing airport). As stated in the regulation (14 CFR Part 157.1,

[2] See https://www.faa.gov/forms/index.cfm/go/document.current/documentNumber/7480-1.

"Applicability"), notice is not required for temporary or intermittent use of a site that is not established as an airport.

2.2.2.6.3 When completing a Form 7480-1, the form asks the project proponent to identify any obstructions (buildings, power line wires, roads, railroads, towers, etc.) within the vicinity of the runway(s). Existing or planned incompatible development such as schools, churches and residential communities that may be impacted by noise, and waste disposal sites within a five-mile radius (see "Wildlife and Bird Attractants," Section 2.2.3), may affect development. FAA will consider and comment on potential hazards to air navigation due to land use compatibility conflicts. However, the local municipality is ultimately responsible for permitting development through local zoning, and other state or local land use and development ordinances and processes.

2.2.2.7 Military Airspace Areas**.**

2.2.2.7.1 In addition to the areas defined for civil airports, communities should consider military operational areas, ranges, and bases when planning for land use compatibility. The Department of Defense (DOD) Office of Economic Adjustment (OEA) established two programs, one in the 1970s and one in the 1980s, to promote land use compatibility near military installations.

2.2.2.7.2 The first is the Air Installation Compatibility Use Zones (AICUZ) Program. This program establishes policies and guidelines to protect military operational compatibility by avoiding incompatible development that would prevent military installations from changing or expanding to meet new mission requirements.

2.2.2.7.3 The second program, the Joint Land Use Study (JLUS) Program, complements the AICUZ program. Through this program, the OEA provides technical and financial assistance to state and local governments to plan and implement strategic plans that support civilian growth and development that is compatible with military operations.

2.2.2.8 Visual, Atmospheric and Electronic Interference**.**

Maintaining an unobstructed view for pilots is a critical element of land use compatibility. In addition to physical obstructions, visual obstructions, electronic interference, or atmospheric disturbances can also pose hazards to flight. Many aircraft operations take place without navigational aids and operate under Visual Flight Rules (VFR). Maintaining visual clarity as the pilot transitions to the visual segment of an Instrument Flight Rule (IFR) flight plan (i.e. transitioning from looking at flight instruments to looking outside the cockpit windows) is critical for pilot control and a safe airport approach. Limiting atmospheric interference (such as the air turbulence from thermal plumes) near airports is critical to maintaining aircraft control.

Electronic interference is also a compatible land use consideration. This includes high-energy use, production or transmission facilities, or installations on an institutional, commercial, or industrial property that may affect navigational aids (NAVAIDs). The following sections discuss the concerns related to visual, atmospheric, and electronic interference. ACRP Report 108, *Guidebook for Energy Facilities Compatibility with Airports and Airspace*, provides research findings on some of these land use concerns.

2.2.2.8.1 Visual Obstructions.

- Open mining and construction activities can produce dust or other particulate matter that impact airport visibility. Dust can be picked up by the wind and create a dangerous situation for pilots trying to navigate through the area without instrumentation.
- Glare reflecting into and impacting flight approaches to an airport may be caused by the reflection of light off water bodies and shiny building materials used in proposed or existing development. Glare reflected back to the airport approaches at a particular angle can temporarily impair a pilot's vision during low-level flight operations, and can therefore be dangerous.
- Light emissions are also a potential concern, especially when large light concentrations shine upward in a flight path or towards the runway environment. These concentrated emissions can adversely affect a pilot's visual ability during evening hours, storm events, fog/smog, and other periods of reduced visibility.
- Other sources of light emissions include lighting in linear patterns that could be mistaken by pilots for airport operational areas. Furthermore, bright lights can cause momentary visual impairment for pilots as they pass between darkness into well-lit areas. Additionally, certain colors of neon lights (especially red and white) are a concern near airports and military installations because they can interfere with night vision goggles used by pilots.
- Large billboards using flashing/changeable message LED-illuminated signs near airports are a concern because they may distract pilots. Airport and zoning officials should carefully evaluate the potential impacts before approving these proposals. Some state and local jurisdictions have enacted sign and structure lighting use controls/standards (in their zoning and permitting ordinances) to protect against direct, intense light near airport approaches.
- Laser light shows or devices used in amusement parks, stadium events, or other outdoor productions should be regulated within the airport environs. This includes preventing lasers from being directed towards the flight pattern or airport approaches where they could affect aircraft. In addition, local awareness and law enforcement against inadvertent or

malicious direction of lasers towards airport approaches, or at aircraft, is important.

- Smoke, steam and smog can hinder a pilot's ability to navigate aircraft due to reduced visibility. Smog is hard to control because it is common over large cities (it is usually present as a blanket of blurriness), but source-points of smoke and steam can be better controlled. Smoke and/or steam stacks are a typical element of industrial operations or large institutional facilities. Local land use authorities should carefully consider placement of these elements in an airport's environs.

2.2.2.8.2 Atmospheric Interference.

- Land use planning around an airport should account for impacts to aviation from facilities that produce atmospheric interference, such as thermal exhaust plumes. FAA has determined thermal exhaust plumes can disrupt flight in the vicinity of an airport. The effect can vary greatly depending on several factors: local winds, ambient temperatures, stratification of the atmosphere, size, height, and number of the stack(s) emitting the plume(s), proximity to airport and flight paths, temperature and vertical speed of the effluent, and the size and speed of aircraft. When evaluating the potential impact of the exhaust plume(s), airport owners/operators should consider the traffic pattern, approach and departure corridors, and any existing or planned flight procedures.

- To aid review of the potential location of thermal exhaust plume facilities, the FAA contracted with MITRE Corporation to develop a thermal exhaust plume model. The model predicts the size and severity of the plume(s) in order to better understand potential atmospheric interference. The "Exhaust-Plume-Analyzer" is available at http://www.mitre.org/research/technology-transfer/technology-licensing/exhaust-plume-analyzer.

2.2.2.8.3 Electronic Interference.

- Land uses that can produce electronic interference should be carefully considered when located near an airport. Electronic interference can affect navigational aids used by pilots during takeoff and landing. Interference can be direct interference with the navigation signal (i.e. transmitting locally on a frequency that is close to the NAVAID frequency or a harmonic of that frequency) or indirect interference (through adverse reflections, blocking of the signal by structures, or some interfering activity at a location).

- For example, alternative energy sources are being used near or on airport property. Wind energy generated by turbines is a concern due to adverse effects to radio aids to navigation and radar (as well as the height of the turbines, which can become an obstruction to flight).

2.2.3 Wildlife & Bird Attractants.

2.2.3.1 From 1988 to 2015, reported wildlife strikes killed more than 262 people and destroyed over 247 aircraft worldwide. According to the FAA report, *Wildlife Strikes to Civil Aircraft in the United States, 1990-2015*, the number of annual wildlife strikes reported to FAA has increased over seven-fold: from 1,851 in 1990 to a record 13,795 in 2015. Birds were involved in 95.8% of total reported strikes, terrestrial mammals in 1.6%, bats in 2.3%, and reptiles in 0.3%. Over this 27-year period, civilian aircraft strikes in the US resulted in 26 human fatalities. Sixty-eight aircraft were destroyed or damaged beyond repair.

2.2.3.2 Of the wildlife strikes reported to FAA, the majority happened at or below 500 feet above ground level (AGL). Nearly twice as many strikes occurred during the landing (final approach or landing roll) phase of flight than during takeoff run and climb.

2.2.3.3 Based on the preceding, aircraft collisions with wildlife are steadily increasing each year and threaten aviation safety. Factors that contribute to this increasing threat include:

- Populations of large bird and mammal species commonly involved in strikes have increased over the last few decades and are adapting to living in urban environments, including airports.
- According to the 2018 FAA Terminal Area Forecast (TAF), the number of operations at towered airports is expected to increase from over 50 million in 2017 to over 65 million in 2045.
- Older three and four engine aircraft are being replaced with newer, more efficient two-engine aircraft. In the event of multiple engine ingestion, aircraft with two engines may have vulnerabilities not shared by three or four engine aircraft. Additionally, the newer, quieter engines may not be as easily detected by birds to avoid collision.

2.2.3.4 ACRP Report 32, *Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports,* identifies the six most hazardous species or species groups for fixed-wing aircraft having one or two engines weighing less than 59,525 pounds:

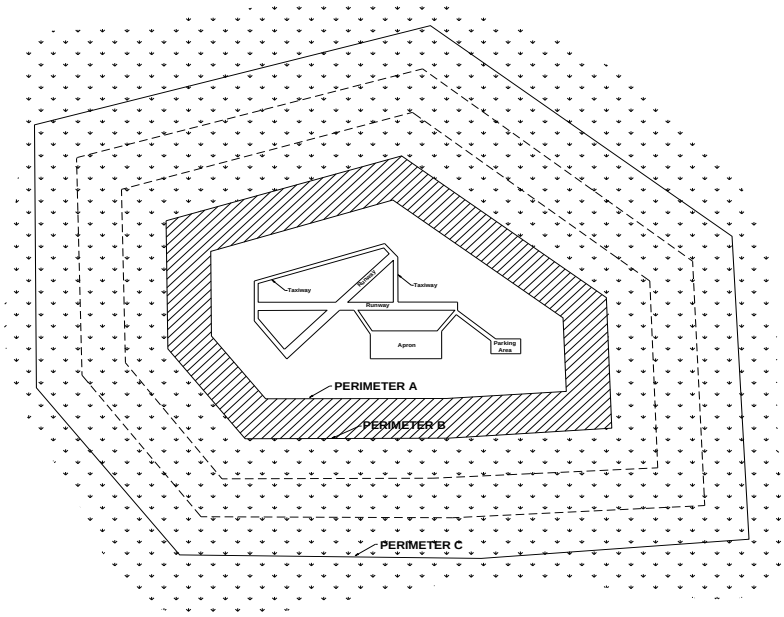
- Deer
- Gulls/Terns
- Geese
- Ducks
- Raptors
- Vultures

2.2.3.5 Minimizing land uses near airports that attract wildlife reduces the likelihood of wildlife strikes. With the majority of strikes occurring at or below 500 feet AGL, it is critical for airport owners/operators and local land use authorities to plan for compatible uses near airports and avoid uses that attract wildlife. There are typically three categories of attractants: food, shelter/cover, and water. Common attractants include certain agricultural or aquaculture activities, architectural features, landscaping, surface mining, waste disposal sites, wastewater treatment facilities, and wetlands. ACRP Report 32 includes a more detailed discussion of the uses considered attractive to wildlife.

2.2.3.6 FAA AC 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports*, defines wildlife attractants as "any human-made structure, land use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace, or Airport Operations Area (AOA)." **Figure 2-7** shows the areas around an airport to prevent wildlife attractants.

2.2.3.7 See Section 5.5.1, *Wildlife Hazard Management Plans*, for a description of needed plans and assessments developed under FAA AC 150/5200-33. See Appendix D for a U.S. Department of Agriculture (USDA) listing of plants that are attractive to wildlife and should be avoided on or near airports.

Figure 2-7. Wildlife Hazard Separation Distances



PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

Source: Graphic Developed by FAA Central Region Airports Division based upon guidance in FAA AC 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports.*

2.2.4 Runway Protection Zones (RPZs).

2.2.4.1 The purpose of the Runway Protection Zone (RPZ) is to enhance the protection of people and property on the ground. This is best achieved through airport owner control over RPZs. Airport owner control over RPZs may be achieved through:

- Ownership of the RPZ property in fee simple;
- Possessing sufficient interest in the RPZ property through easements, deed restrictions, etc.;
- Possessing sufficient land use control authority to regulate land use in the jurisdiction containing the RPZ;
- Possessing and exercising the power of eminent domain over the property; or

- Possessing and exercising permitting authority over proponents of development within the RPZ (*e.g.*, where the sponsor is a State).

2.2.4.1.1 Control is preferably exercised through acquisition of sufficient property interest and includes clearing RPZ areas (and keeping them clear) of incompatible objects and activities. The FAA recognizes, however, that land use compatibility within RPZs is often complicated by land ownership, environmental, geographical and other considerations.

2.2.4.2 RPZs are trapezoidal in shape, centered about the extended runway centerline, and typically located off each runway end. The full standards and dimensions for RPZs are in FAA Advisory Circular 150/5300-13A, *Airport Design*. This AC replaces the FAA's "Interim Guidance on Land Uses Within a Runway Protection Zone," dated September 2012.

2.2.4.3 Expectations of Airport Sponsors.

The FAA expects all airport sponsors to comply with FAA Grant Assurances. These include, but are not limited to, Assurances 19 (Operations and Maintenance) and 21 (Compatible Land Use). Sponsors should take appropriate measures to protect against, remove, or mitigate land uses that introduce incompatible development within RPZs.

2.2.4.4 Existing Incompatible Land Uses.

2.2.4.4.1 The FAA expects airport sponsors to seek all possible opportunities to eliminate, reduce, or mitigate existing incompatible land uses. Examples may include land acquisition, land exchanges, right-of-first-refusal to purchase, agreements with property owners on land uses, easements, or other such measures. The FAA also expects sponsors to actively consider and evaluate available options anytime there is an ALP update or master plan update, and to be vigilant for any other opportunities that may arise from time to time (especially to purchase land) to eliminate or minimize existing incompatibilities. The FAA expects airport sponsors to document their efforts to demonstrate they are complying with relevant FAA Grant Assurances.

2.2.4.4.2 **Table 2-2** outlines expectations of airport sponsors for existing incompatible land uses within RPZs.

Table 2-2. Expectations of Airport Sponsors - Existing Incompatible Land Uses

Type of Land Use Control	Expectations of Airport Sponsors
If the airport sponsor owns or has total land use control (e.g., sponsor is the land use control authority and regulates land use in the local jurisdiction)	Because the sponsor has total land use control, the FAA considers it a reasonable expectation that the sponsor will establish and enforce the necessary zoning controls to enable it to address existing incompatible land uses when the opportunity arises.
If the sponsor has potential influence (*e.g.*, Airport Authority without zoning control)	Because the sponsor has at least some influence over land use control, the FAA considers it a reasonable expectation that the sponsor will seek to establish the necessary zoning controls to enable it to address existing incompatible land uses when the opportunity arises.
If the sponsor has no land use control (*i.e.*, RPZ land falls in another jurisdiction)	Even though the sponsor has no land use control, the FAA still considers it a reasonable expectation that the sponsor will actively watch for opportunities to establish the necessary zoning controls to enable it to address existing incompatible land uses when the opportunity arises. FAA will consider financial assistance to a public-sector sponsor for land acquisition even if they have no land use control, but only if the sponsor can demonstrate that they are taking all appropriate steps available to enhance control and mitigate existing risks.

2.2.4.4.3 The FAA will consider requests from eligible airport sponsors for AIP funding, in accordance with the AIP handbook, to help secure ownership or land use control if it helps eliminate existing incompatible land uses, and prevent future ones. FAA also expects airport sponsors to consider RPZ protection an "airside need," a high priority for financial planning purposes.

2.2.4.5 Proposed Incompatible Land Uses.

The FAA expects the airport sponsor to take active steps to prevent or mitigate proposed incompatible land uses. The FAA will not always require an airport sponsor to acquire land in order to meet the RPZ standard. However, the FAA does expect the airport sponsor to actively seek opportunities to prevent or mitigate risks associated with proposed incompatible land uses within the RPZ. Sponsors should actively monitor conditions and object publicly to proposed incompatible land uses, and to make it a high priority (financially or otherwise) to acquire land or otherwise establish land use controls that prevent incompatible uses. The FAA expects airport sponsors to document their efforts so that they can demonstrate that the airport is complying with its grant assurances. **Table 2-3** summarizes expectations of airport sponsors for new/proposed incompatible land uses within RPZs.

Table 2-3. Expectations of Airport Sponsors - New Incompatible Land Uses

Type of Land Use Control	Expectations of Airport Sponsors
If the airport sponsor owns or has total land use control (*e.g.*, sponsor is the land use control authority and regulates land use in the local jurisdiction)	Because the sponsor has total land use control, the FAA expects that the sponsor will establish all necessary protections to prevent new incompatible land uses.
If the sponsor has potential influence (*e.g.*, Airport Authority without zoning control)	FAA expects the sponsor to take all appropriate steps available to establish and exercise zoning controls necessary to prevent any new incompatible land uses. The FAA recognizes that the standard of "appropriate action, to the extent reasonable" does not mean in this case that the sponsor can always prevail. Rather, the FAA expects the sponsor to demonstrate and document a reasonable effort.
If the sponsor has no land use control (i.e., RPZ land falls in another jurisdiction)	Even if the sponsor has no land use control, FAA still expects the sponsor to actively pursue and consider all possible steps to secure land necessary to prevent any new incompatible land uses. The FAA recognizes that the standard of "appropriate action, to the extent reasonable" may not succeed. Even so, the FAA expects the sponsor to demonstrate and document a reasonable effort. FAA expects the airport sponsor to adopt a strong public stance to oppose incompatible land uses and to communicate the purpose of the RPZ and associated risks to the proponent, and to actively consider measures such as land acquisition, land exchanges, right-of-first-refusal to purchase, agreements with property owners regarding land uses, or other such measures. For a privately owned reliever in such circumstances, the FAA will still consider helping with land acquisition, but the sponsor needs to demonstrate a viable long-term plan that these measures will ultimately protect the airport against encroachment.

2.2.4.5.1 FAA will consider requests from eligible airport sponsors for AIP funding, in accordance with the AIP Handbook, to help prevent new incompatible land uses. However, FAA also expects sponsors to identify these opportunities early enough for land to be acquired at a reasonable cost (*i.e.*, not waiting until there is a proposed development that artificially increases the cost of the land).

2.2.4.6 Airport Sponsor's Alternatives Evaluation Process.

2.2.4.6.1 As stated, the FAA expects the airport sponsor to take active steps (in accordance with Grant Assurances 19 and 21) to prevent or mitigate any new incompatible land use within the RPZ. Because Assurance 21 requires sponsors to take "appropriate action, to the extent reasonable," the FAA expects sponsors to proactively identify a full range of alternatives and prepare a sufficient evaluation to be able to draw a conclusion about what is "appropriate and reasonable." The evaluation may include the development of a long-term, strategic land acquisition plan.

2.2.4.6.2 Potential new incompatible land uses within an RPZ might be caused by one or more circumstances, including (but not limited to):

- An airfield project (e.g., runway extension, runway shift);[3]
- A change in the critical design aircraft that increases the RPZ dimension;
- A new or revised instrument approach procedure that increases the RPZ dimension;
- A local development proposal in the RPZ; or
- Other circumstances.

2.2.4.6.3 The sponsor should submit an alternatives evaluation to the FAA unless the land use is permissible without further evaluation per FAA AC 150/5300-13. The land uses, which require no further evaluation, are listed again immediately below:

- Farming that meets airport design standards;
- Irrigation channels that meet the requirements of AC 150/5200-33 and FAA/USDA manual, Wildlife Hazard Management at Airports;
- Airport service roads, as long as they are not public roads and are directly controlled by the airport operator;
- Underground facilities, as long as they meet other applicable design criteria (such as Runway Safety Area [RSA] requirements); or
- Unstaffed NAVAIDs and facilities, such as equipment for airport facilities that are considered fixed-by-function in regard to the RPZ.

[3] Please note that these projects are limited to existing airports. The FAA would not support incompatible uses in RPZs for new airports or new runways.

2.2.4.7 **Items Typically Included in the Airport Sponsor's Alternatives Evaluation**.

2.2.4.7.1 Airport sponsors should submit an alternatives evaluation to FAA early in the planning process for any on-airport development within the RPZ. When the proposed land use development is not on airport property, the sponsor should engage and coordinate with the Airports District Office (ADO) as soon as they are aware of proposed development. The sponsor should begin the process of evaluating alternatives within 30 days of becoming aware of the development within the RPZ.

2.2.4.7.2 The following items are typically necessary for the FAA to fully assess a sponsor's alternatives evaluation. The FAA acknowledges, however, that the scope of the analysis will likely vary depending on the size of the airport, the type/number of operations, and any other unique considerations. The airport sponsor is encouraged to meet with the FAA before conducting the evaluation to discuss the appropriate level of evaluation needed.

- Sponsor's statement of the purpose and need of the proposed action (airport project, land use change or development).
- Identification of any other interested parties and proponents.
- Identification of any federal, state and local transportation agencies involved.
- Analysis of sponsor control of the land within the RPZ.
- Summary of all alternatives considered including:
    - Alternatives that preclude introducing the incompatible land use within the RPZ (e.g., zoning action, purchase, and design alternatives such as the implementation of declared distances, displaced thresholds, shifting the runway, shortening the runway, raising minimums)
    - Alternatives that minimize the impact of the land use in the RPZ (e.g. routing a new roadway through less of the RPZ, etc.)
    - Alternatives that mitigate risk to people and property on the ground (e.g., tunneling, depressing and/or protecting a roadway through the RPZ, implementing operational measures to mitigate any risks, etc.)
- Narrative discussion and exhibits or figures depicting the alternative.
- Rough order of magnitude cost estimates associated with each alternative, regardless of potential funding sources.
- A practicability assessment based on the feasibility of the alternative in terms of cost, constructability, operational impacts, and other factors.

2.2.4.8 **FAA Assessment of the Airport Sponsor's Alternatives Evaluation**.

2.2.4.8.1 The FAA expects the airport sponsor to submit their alternatives evaluation to the ADO (or Airports Regional Office for regions that do not have ADOs). The ADO will review and provide a response to the evaluation. However, for any unusual cases, the ADO will consult with the Regional Office and, if necessary, FAA's Airport Planning and Environmental Division (APP-400) for FAA Headquarters review. Depending on the circumstances, APP-400 will also include the Airport Engineering Division (AAS-100) and the Compliance Division (ACO-100) in Headquarters review.

2.2.4.8.2 The ADO must assess the sponsor's alternatives evaluation and recommendations for any ALP change or airspace determination that involve new incompatible use or development within an airport RPZ. The ADO's assessment will ensure that the sponsor provides a comprehensive evaluation that includes the appropriate items from Section 2.2.4.7, and that the sponsor has met the expectations described in **Table 2-2** or **Table 2-3**, as applicable.

2.2.4.8.3 It is not the FAA's decision whether the sponsor should accede to a new incompatible land use. Rather, FAA's assessment is limited to whether the airport has made an adequate effort to pursue and give full consideration to appropriate and reasonable alternatives. The FAA will not approve or disapprove the airport sponsors preferred alternative. The FAA will only evaluate whether the sponsor has completed an acceptable level of alternatives analysis before the sponsor makes the decision to allow or not allow the proposed land use within the RPZ. In some cases, coordination with other federal, state, or local agencies may be necessary.

2.2.4.8.4 If the FAA agrees that the sponsor's alternative analysis is acceptable, then the FAA's ALP approval, if any, or airspace determination must include the following statement:

> "This ALP approval (and/or airspace determination) does not constitute FAA approval of incompatible land uses within any Runway Protection Zone. Nor does it relieve the airport sponsor of its obligations under Assurances 19 and 21. Rather, it represents a conclusion by the FAA that the sponsor has conducted a sufficient level of analysis to make its own decision about the risks associated with the proposal."

2.2.4.8.5 If the FAA determines that the sponsor's alternatives analysis is insufficient, then the FAA will provide the appropriate feedback and guidance.

2.2.5 Local Regulation of Concentrations of People (Development Density).

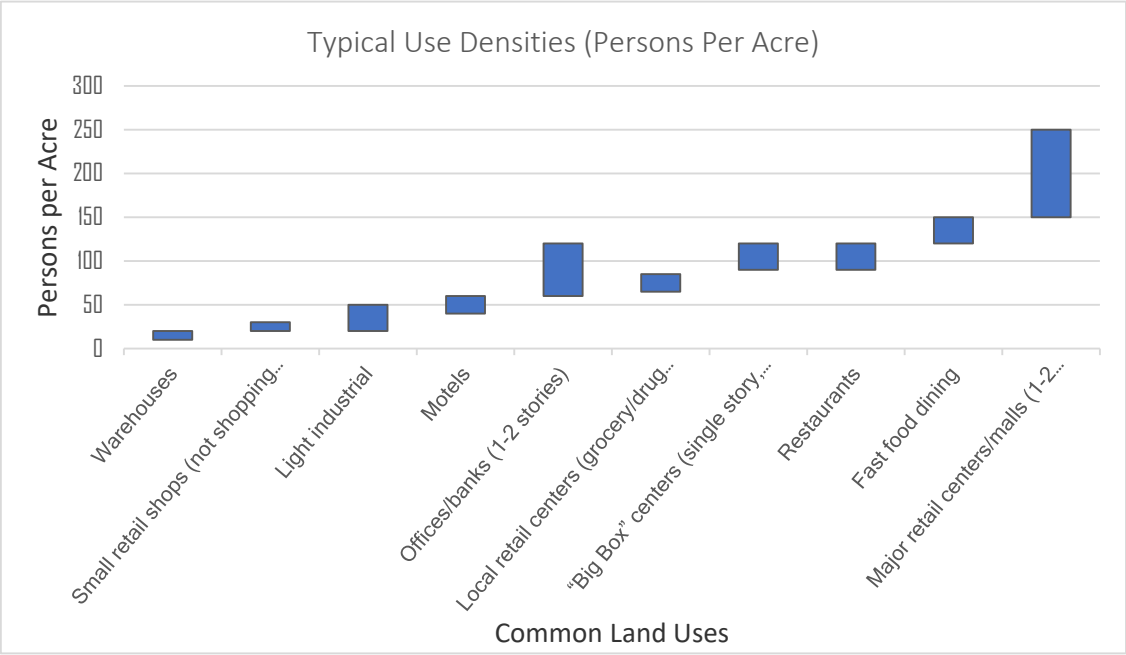
2.2.5.1 The number of people concentrated in an area near an airport is the land use characteristic tied most closely to the consequences of aircraft accidents. The most direct method of reducing the potential severity of an aircraft accident to the people and property in proximity to an airport is to limit the maximum number of structures and/or people in areas close to an airport. Limiting the number of structures around airports may also reduce the severity of an aircraft accident to passengers on board the aircraft.

2.2.5.2 There are two types of accidents that have the potential to impact land uses near the airport. One is an accident where the aircraft is descending, but is flying largely under directional control of the pilot. The other is one involving a loss of control. Limits on usage density—the number of structures/people per acre—are most effective when they account for both types of potential aircraft accidents.

2.2.5.3 Concentrated populations present a greater risk for severe consequences in the event of an uncontrolled accident at that location. The risk is even greater when the land use includes occupants with limited mobility or who need supervision or assistance in evacuating, such as hospital patients or schoolchildren.

2.2.5.4 Limiting the average usage density over a site, coupled with designated areas of open space, reduces the risks associated with either type of accident. Land use compatibility policies need to address both of these circumstances. In some instances, states have published airport land use compatibility measures, including allowable density levels. **Figure 2-8** illustrates the densities within the 2011 California Airport Land Use Planning Handbook, which is often the most widely referenced document for land use compatibility densities. For military airports, safety recommendations are included as part of the AICUZ (Air Installation Compatibility Use Zones) program (see Section 2.2.2.7.2).

Figure 2-8. Typical Use Densities



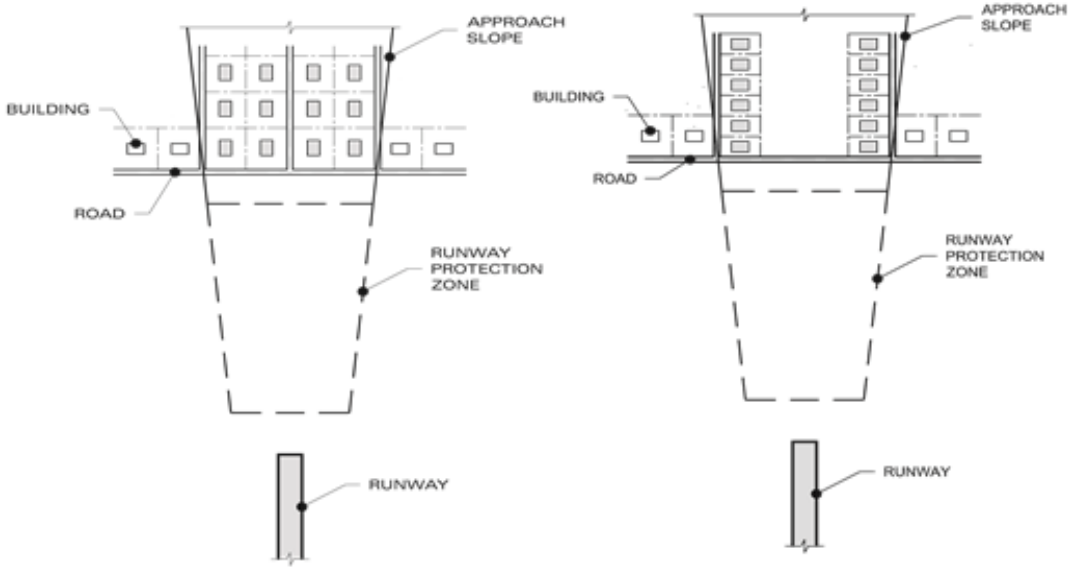
Source: Based on California Airport Land Use Planning Handbook, 2011.

2.2.5.5 In general, the lower the density, the greater the level of compatibility a use will have with aircraft operations. In many instances, an airport and the local community should evaluate density near an airport, taking into account the density of the overall area. For example, if a GA airport is located well outside of a developed area and there are expanses of open space that border the airport, it is important to establish land use controls that will maintain this open area and establish low permissible densities for the area around the airport. In comparison, in most developed areas where large amounts of development may have already taken place and higher residential densities and nonresidential intensities are more likely, the goal would be to require any ensuing development to be at or below the current levels. This essentially focuses on making the current situation no worse. **Figure 2.9** illustrates some general levels of density – high, medium, and low - as it relates to residential land uses.

Figure 2-9. Residential Samples of Densities

2.2.5.5.1 In instances where structures and development can be relocated on a parcel to allow for optimal open space within the approach and departure areas of an airport, the more compatible a use will be with aircraft operations. Maintaining or creating open space within areas of aircraft movement is critical, as it provides clear areas where aircraft can land in the event of an emergency. **Figure 2-10** illustrates a sample modified parcel layout to minimize development within a runway's approach slope, using the same square footage of area within the space. Note that the lots are obviously smaller with more open/common space, which may require special use permits or some form of local approval that is often tied to an airport zoning ordinance or overlay zone.

Figure 2-10. Modified Parcel Layout



2.3 Compatibility of Land Use Types near the Airport.

In community planning documents, land uses are generally classified into one of seven major categories (see **Table 2-4**). These include residential, commercial, industrial and mining, institutional, infrastructure/utilities/energy production, agricultural and open space, and parks and recreational land use. A general discussion of each land use type is provided in the following sections. Because individual communities can categorize these in different ways, it will be important for specific communities to tailor their use of this information to their specific needs.

Table 2-4. Land Use Compatibility Chart

Land Uses	Noise Sensitivity	Concentration of People	Tall Structures	Visual Obstructions	Wildlife & Bird Attractants
Residential Uses	I	I	P	P	P
Commercial Activities	I	I	P	P	P
Industrial and Mining Activities	N	P	P	P	P
Institutional Activities	I	I	I	I	I
Infrastructure/Utilities/ Energy Production Activities	N	N	I	I	P
Agriculture and Open Space Activities	N	N	N	I	I
Parks and Recreation Activities	I	P	P	P	P

Key:
I *= Impact*
P *= Possible Impact*
N *= No Impact*

2.3.1 Residential Uses.

2.3.1.1 A residential use includes dwellings used to house people as their residence/domicile. Typically, residential use includes single-family homes (detached, attached, condominium) and multifamily developments such duplexes through four-plex, apartment complexes, dormitories, transient housing, and mobile home parks. As the nation's population continues to increase, residential development often encroaches upon what was once

open space surrounding airport property. Some airports are now completely surrounded by residential development. In planning for new residential development in proximity to an airport, local interagency coordination is vital, especially within an airport's approaches, departure areas, and areas of greater noise exposure.

2.3.1.2 Developments for temporary or short-term occupancy (not permanent residence or domicile) such as hotels, motels, and campgrounds are considered commercial land use. Although these uses may differ from conventional residential use and housing in their sensitivity to noise, they pose similar concerns relative to concentrations of people (also see commercial uses in Section 2.3.2, below).

2.3.1.3 In instances where residential uses cannot be prevented near an airport, there are techniques that can be used to minimize or mitigate the effects of such incompatible development. A few of these include:

- Placement of residential structures on the outer edge of a parcel rather than directly underneath a runway's approach or departure path outside of RPZs (see Section 2.2 for further information).
- Disclosing noise impact and discouraging residential development within 65 dB DNL noise contour.
- Decreasing the allowable density in residential uses near an airport.
- Minimizing the development of multi-family residential units (apartments, etc.).
- Requiring developers to use sound-insulating building materials to minimize aircraft noise effects.

2.3.2 Commercial Uses.

2.3.2.1 Land uses classified as commercial involve the sale of products or services for profit. The most common land use compatibility issues with commercial uses are safety impacts to the commercial use, visual interference, and wildlife attractant impacts to aircraft and the airport. Commercial uses are specifically discouraged from RPZs due to the density issues that they can pose. Using the tools in this AC and other referenced resources, the compatibility of a specific commercial use may be evaluated on an individual airport basis. Because there are a wide variety of commercial uses, the actual activities onsite often require special review and evaluation by local planners to determine compatibility with airport influence areas. Because diverse compatibility issues can arise between an airport and nearby commercial land uses, it is difficult to summarize the benefits or detriments created by commercial development.

2.3.2.2 Sample factors to consider when determining compatibility of a commercial use include, but are not limited to:

- The time of operation and occupancy (e.g., all day, evenings only, 24 hours, etc.).
- The size of the commercial buildings and their lighting, height and facility characteristics (e.g., boutique shop, big-box stores, mega-mall, etc.).
- Anticipated occupancy (e.g., a few employees, waves of customers, sustained large crowds, etc.).
- Method of trash containment for large commercial uses (e.g., evaluate if wildlife attractant, holds hazardous materials, or benign).
- Parking lot lighting patterns for large commercial uses (e.g., use of LED, shielding, zoning allowances, etc.).
- Outdoor uses (e.g., assembly of people, patios where aircraft noise may be an issue).
- Amount of open space around the structures (e.g., approach clearances, parking lots, green space, etc.).

2.3.3 Industrial and Mining Uses.

2.3.3.1 Industrial development can include materials processing, materials assembly, product manufacturing, and storage of finished products. The most common land use compatibility issues with industrial uses are height of structures, visual interferences, and wildlife attractant impacts to aircraft and the airport. Industrial/manufacturing uses are specifically discouraged from RPZs due to the assembly of persons/occupancy density issues that they can pose. Using the tools in this AC and other referenced resources, the compatibility context and specific use may be evaluated on an individual airport basis. A range of uses are classified in this land use type from heavy manufacturing plants with tall smoke stacks to a small product distribution center. Historically, industrial parks were composed solely of industrial uses, however now they often include a mix of industrial businesses, manufacturing facilities, office parks, and research and development complexes within the same geographic area. Occasionally, hotels, restaurants, and retail activities develop along the fringes of industrial parks to provide necessary support facilities and stimulate economic development within these areas. Light manufacturing or research and development facilities are often less of a concern with reduced staff levels and partial, traditional hours of operation.

2.3.3.2 Mining and natural resource extraction (minerals, petroleum, natural gas, etc.) can cause visual obstructions with the generation of dust at the extraction sites, as well as intense lighting used to illuminate areas for night work. Tall structures can also be a concern, depending on the type of equipment used. FAA AC 150/5100-20, *Guidance for Oil and Gas*

Development at Obligated Airports, describes existing FAA requirements concerning oil and gas development on or nearby airports.

2.3.3.3 Some of the main concerns typically associated with industrial and/or mining uses include:

- Number of employees on site;
- Hours of operation (manufacturing plants that run 24 hours a day with three shifts);
- Tall towers or stacks that can obstruct flight;
- The presence of smoke or steam from processing facilities;
- Thermal plumes that can cause turbulence;
- Intense lighting around facilities;
- Dust generation;
- Storage of flammable materials; and
- Water retention/detention areas.

2.3.4 Institutional Uses.

2.3.4.1 Institutional uses include educational facilities (preschool through college), health care facilities (hospitals, clinics, nursing homes, assisted living facilities), and religious assemblies (churches, tabernacles, mosques). Because the majority of these facilities are used by individuals who may not be able to respond to an emergency situation without assistance, they are generally considered to have a lower level of compatibility and are discouraged in proximity to an airport.

2.3.4.2 The most common land use compatibility issues with institutional uses are safety and noise impacts to institutional uses. Institutional uses are specifically discouraged from RPZs due to the density issues that they can pose. The largest difference between institutional uses and all other land use types is based on the assumption that many of the people who utilize an institutional use may need additional assistance to respond to an aircraft emergency, including the evacuation of a facility. An example of this issue is evacuating patients from a hospital. These users are most often present in concentrations, which makes it even more difficult to respond to an emergency situation.

2.3.4.3 In addition to concerns regarding evacuation and other emergency response procedures, institutional uses are typically more sensitive to aircraft noise. Disruption in a classroom, hospital, or worship environment may be considered an impact to students, patients, and congregations.

2.3.5 Infrastructure/Utilities/Energy Production Uses.

2.3.5.1 Infrastructure activities include a variety of land uses such as above ground utilities, cellular communication towers, water towers, water treatment plants, wastewater treatment plants, streets and highways, sanitary landfills, and energy production uses such as wind turbines and solar panels. One of the most common land use compatibility issues with infrastructure uses is the height impacts to aircraft, such as cellular towers, wind turbines, and large-scale power transmission structures that can be hundreds of feet tall and can create an obstruction to flight in their vicinity. Depending on their location and height, proponents may need to submit an aeronautical study to the FAA through the 7460 Form –Notice of Proposed Construction or Alteration, which can be accessed at https://oeaaa.faa.gov/oeaaa/external/portal.jsp (see Section 2.2.2.3 for additional information on the 7460 Form). As stated earlier, through this process, the FAA has the opportunity to find the proposed use either a hazard or not a hazard to air navigation, recommend appropriate marking and lighting to make objects visible, identify obstacles on aeronautical charts, and revise published data and issue a Notice to Airmen (NOTAM) if necessary.

2.3.5.2 In addition to height concerns, some of these uses can be attractive to wildlife (such as landfills and water treatment plants). This could increase the risk of wildlife strikes if placed within the approach or departure corridors or traffic pattern around an airport. Electronic interference can be generated by uses such as wind turbines that can impact radio aids to navigation and RADAR signals when clustered together in large concentrations. Industrial uses emitting thermal plumes above their smoke/exhaust stack heights may impact safe flight near airports. The aeronautical impacts in addition to the height of structures are still being discovered that may warrant compatible land use evaluation.

2.3.5.3 Limiting concentrations of people associated with transportation infrastructure in proximity to an airport is ideal. When possible, limiting transportation modes within the approach or departure zones can minimize the potential for catastrophic effects should an aircraft incident occur. Because many airports are already located in developed areas, citing a specific distance between an airport and these other modes becomes unrealistic, as they may already exist in proximity to the airfield. Although some of these uses may not be able to be relocated, techniques such as down shielding lighting along highways and railroads can help to mitigate some of their impact (visual obstructions). Additional techniques such as adding roadway signage alerting vehicles to the RPZ, or prohibiting stopping and standing in the RPZ is recommended. Airports should also work with their local transportation department to avoid locating stoplights near the edge of the RPZ to prevent queues from building into the RPZ. The goal is to minimize the overall impact based upon the various issues

discussed in this chapter (visual obstructions, concentrations of people, etc.).

2.3.5.4 State and local planning and design of infrastructure development away from airport operating environs is encouraged. Due to the wide variety of land uses that fall within the infrastructure/utilities/energy production category, there are a number of concerns related to infrastructure land uses that vary depending on the individual use at a location near an airport. Therefore, FAA recommends that each proposed development or improvement of infrastructure within the vicinity of an airport be assessed for compatibility issues prior to construction.

2.3.6 Agriculture and Open Spaces.

2.3.6.1 Agriculture and open space activities are most commonly defined as any use related to farming, including both man-made and naturally occurring water resources. The most common land use compatibility issues with agriculture and open space uses are wildlife attractant impacts to aircraft and the airport. These uses are often perceived as the most compatible of land use types near an airport due to the limited populations associated with them and reduced noise sensitivity. However, they can have significant wildlife management concerns.

2.3.6.2 Certain crops can be very attractive to wildlife for both food sources as well as roosting habitats (see Appendix D for a listing of crops from the USDA). Agricultural activities are not uncommon near airports, especially in the Midwestern and plains states. Open water such as rivers, lakes, and detention/retention ponds can be attractive to wildlife and are cause for concern.

2.3.7 Parks and Recreation/Entertainment Uses, including Sports Arenas.

2.3.7.1 A wide variety of public and commercial recreational land uses can be classified here, including (as but a few illustrative examples) public parks, public use and access national monuments, wildlife refuges, wilderness areas, community tennis centers, drive-in theaters, and professional race tracks. These uses typically take place outdoors, although some take place indoors such as skating rinks, health clubs, and sports arenas. The most common land use compatibility issues with parks and recreation uses are safety impacts to recreational uses. Due to the wide variety of uses, development sizes can play an important role in the level of compatibility. For example, a neighborhood park that has open space would typically be considered more compatible than an aquatic center that has large areas for parking and limited open space. Uses such as golf courses that include water or wildlife habitat features need to be prevented or mitigated for any potential wildlife attractants that may pose a hazard to a nearby airport.

Public areas that are used for educational or performance purposes may also be noise sensitive uses.

2.3.7.2 In addition to the size and use of the development, lighting can be a concern for recreational uses because associated parking lots are often lit with high-density lights. Moreover, facilities that are used at night such as baseball fields and tennis courts are also illuminated with bright lights that can create visual challenges for pilots.

2.3.7.3 Another factor to consider is the density of the use. For example, a casino will often have a greater density because customers and staff occupy the facility 24 hours a day, compared to a golf course which has a larger footprint but is operational only during daylight hours and at a lower density.

CHAPTER 3. ROLES AND RESPONSIBILITIES OF COMPATIBLE LAND USE STAKEHOLDERS

3.1 Overview of Stakeholders.

3.1.1 This Chapter discusses the roles and responsibilities for land use compatibility as they relate to the multiple levels of government and interested community groups involved in planning for land development around airports. Airport land use compatibility planning requires coordination among diverse groups, including public agencies, airport leaders, and citizens. Stakeholders with the airport in developing compatible land use planning include:

- Airlines and other aeronautical users
- Airport-based businesses
- Traveling public
- Business community
- Educational institutions
- Healthcare institutions
- Real estate developers
- Metropolitan planning organization
- Transportation agencies
- Recreational facilities

3.1.2 This is because the responsibility for airport land use compatibility planning does not normally rest with one agency or a single group. The tasks, authority, and responsibilities are divided between federal, state, regional, and local groups and organizations. In addition, the airport's geographic area of influence will often encompass several jurisdictions that may or may not have a sponsor or ownership interest in the airport. Airport and community planners have unique stakeholder relationships locally that can be used to develop effective coordination agreements for their compatible land use planning efforts (also see Chapter 4).

3.1.3 Federal and state agencies develop guidelines and recommendations to protect airports and the associated airspace, while local government officials, planners, airport sponsors, and community members implement and enforce the land use programs. Other groups, including regional transportation agencies, local economic development corporations and transit services, all make plans and financial investments that drive land development and land use patterns. **Table 3-1** is a more complete listing of the various stakeholders.

1524 **Table 3-1. Summary of Airport Related Stakeholders**

Section	Category	Description
3.2	Local Government Stakeholders	Elected and appointed bodies from cities, villages, townships and counties Planning and zoning officials Regional/Metropolitan Agencies (transportation, economic development, planning coordination)
3.3	Airport Related Stakeholders	Governing Body / Airport Sponsor Airport Manager Airport Users (airlines, FBOs, local pilots)
3.4	Non-Aviation Stakeholders	Shipping companies Rental car companies Cargo handling services Local citizens living near airports
3.5	Organized Groups in Surrounding Jurisdictions	Chamber of Commerce Economic development organizations Civic and volunteer organizations
3.6	General Public	Community leaders Business travelers Local business owners
3.7	Real Estate and Development Interests	Realtors Land development companies Large landholders near the airport Land use attorneys
3.8	State Government Stakeholders	State Aeronautical Departments Department of Agriculture Department of Economic Development Department of Environmental Quality Department of Historic Preservation Department of Community Health and Human Resources
3.9	Federal Government Stakeholders	Department of Transportation (DOT) Federal Aviation Administration (FAA) Army Corps of Engineers Department of Defense Department of the Interior

Section	Category	Description
		Department of Transportation Environmental Protection Agency Federal Communication Commission

3.2 Local Government Stakeholders.

3.2.1 Whether it is passing a local airport zoning ordinance or coordinating with nearby municipalities that may be affected by airport operations within their jurisdiction, numerous planning and permitting entities and individuals in local government are in a position to regulate land use. They can also be stakeholders in land use compatibility planning at an airport. In fact, the responsibility for implementing land use compatibility plans rests with local officials and authorities to enact and enforce land use development and zoning regulations. Airport stakeholders can work with these individuals and bodies, as well as with planning and zoning staff, to provide input on land use compatibility through the comprehensive planning process that will help with decisions about zoning districts, densities, and airport overlay zones.

3.2.2 Local land use decisions that promote airport land use compatibility have a bearing on continuing federal support of needed airport improvements. This is because federal grant dollars come with a number of conditions through their grant assurances, all of which an airport agrees to in order to protect the public investment. One of these, Grant Assurance 21, Compatible Land Use, stipulates in part that the airport sponsor "*will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft.*" Under the grant assurance, an airport sponsor or airport owner that also holds local land use authority is expected to develop appropriate policy and procedures to secure land use compatibility within its jurisdiction. Airport sponsors that do not have the land use authority to regulate the land use within an adjoining jurisdiction should still work cooperatively with that local land use authority to implement appropriate land use policy.

3.2.3 An airport sponsor should solicit and employ the cooperation of all of its neighboring local jurisdictions to promote the benefits of compatible land use for their community. Primary local government stakeholders include elected/appointed officials, planning and zoning officials, and regional agencies and authorities.

3.2.4 Elected/Appointed Bodies.

Coordination and communication between elected and appointed officials and airport sponsors is vital to effectively implement and enforce land use compatibility initiatives because most land use decisions are vested with local governments. Local government stakeholders represent a diverse group that includes cities, villages, townships, counties, as well as regional planning organizations, transportation agencies and local economic

development agencies. To be most effective in their land use decision making, these stakeholders need to understand both the adverse effect that incompatible land use can have on a local airport and the negative effects airport operations can have on surrounding land uses. Conversely, these groups need to be well informed regarding the positive economic impact that an airport brings to the community and the ways that compatible land use can occur near an airport when state and local regulations call for land use categories, densities, and site development requirements that protect the operation of the airport. An airport has a positive economic impact on the region in terms of jobs and income as well, and the airport can be crucial in attracting new businesses and skilled employees to an area. Leaders of regional and local economic development agencies that recognize the high value of airports to the community can play a leading role in advocacy.

3.2.5 Planning & Zoning Officials.

3.2.5.1 Local planning and zoning agencies derive land use powers from a variety of sources, including state legislation and state constitutions. Officials in these agencies are the "front-line" in the land use decision-making process. They are responsible for the two primary tools available for local guidance and control (respectively) of land uses around airports: the Comprehensive Plan and the Zoning Ordinance.

3.2.5.2 The Comprehensive Plan is a guidance document that explains the community's goals and objectives regarding future development. This document often has a 30- or 40-year planning horizon. This is a longer-term than the typical 20-year focus of an Airport Master Plan. In addition to guiding local land use regulation, the Comprehensive Plan also guides investment decisions laid out in the Capital Improvement Program. These community investments often provide the public infrastructure to support economic development in prescribed locations.

3.2.5.3 The Zoning Ordinance is the regulatory document that defines and controls land use zones, and provides development standards and requirements within each zone. The base zoning district designations define general land use types that are permitted within the geographic limits of the zone. Categories typically include titles such as agriculture, residential, commercial, industrial, and institutional (which are explained in Section 2.3). Districts may be divided into sub-categories, which may add further definition to a zoning district. The zoning ordinance defines which uses are permitted, the type of development approval needed, and the lot development requirements in each district. For instance, an R-1 residential zoning district may allow single-family development on one-acre lots with administrative approval. An R-2 residential zoning district may allow duplex dwellings on quarter acre lots. The local land use authority should understand that land use types, densities, and design characteristics are all important to providing compatible land uses near an airport. The local

planning official is well positioned to provide information and advocate for compatible land uses within the local land use framework.

3.2.6 Regional Agencies.

3.2.6.1 Regional agencies such as Metropolitan Planning Organizations (MPOs) are in a position to provide regional guidance related to airport compatible land use planning. Regional agencies may be able to serve as a neutral facilitator when coordination among multiple local governments is needed to provide for comprehensive airport compatibility throughout an airport influence area. An MPO is a group comprised primarily of local elected officials that serve as a forum for local decision making on transportation system and regional planning matters.

3.2.6.2 MPOs can serve as an important link in the compatible land use process because they are looking at the transportation system in a broader geographic area. This regional perspective often corresponds more directly to the area where land use effects are found because airport protection zones often cross multiple jurisdictional lines. An MPO ensures that state and federal laws pertaining to regional transportation planning are implemented in each metropolitan planning area. An MPO can bring the airport director into the conversation as a committee member, and open lines of communication between the airport and the land use professionals in the region. MPOs plan for future transportation investments using federal and local funds, which are then factored into local land use plans. Transportation investments and enhancements are known to be drivers of private economic development.

3.2.6.3 MPOs have the ability to look beyond individual municipal boundaries to assess land use effects and mitigation measures for the benefit of the larger area of influence. For instance, a new highway exit can be expected to generate a cluster of highway commercial development near the exit ramp, as well as residential and industrial development in the area. If this highway exit is located near an airport approach area, this stimulated growth may be detrimental to the compatibility goals of the airport. Consequently, coordination on the type of investment becomes important.

3.3 Airport Related Stakeholders.

Airport related stakeholders include those responsible for airport administration and management as well as airlines, airport businesses/Fixed Base Operators (FBOs) and local pilots. The specific stakeholders will vary depending on the size and type of airport. At smaller airports, administration and management may be carried out by a single airport manager, and local pilots are responsible for aircraft operations. Larger airports may operate with a multiple-person airport administration, and commercial airline service with administrative staff employed at the airport. At airports of all sizes, the local airport stakeholders are responsible for working with local government stakeholders to maintain

and even increase land use compatibility between the airport and the surrounding community. The specific roles and responsibilities of each airport representative are discussed in more detail in the following sections. In general, airport representatives need to take actions that raise the visibility and public awareness of the airport as a part of the land use planning conversation.

3.3.1 Governing Body/Airport Sponsor.

3.3.1.1 Airport influence areas usually span more than one municipal boundary. Therefore, it is typical to need the support of multiple local agencies to address local land use for a single airport. The airport sponsor should seek to establish a working relationship and open lines of communication with the local government officials and planning and zoning staff within the airport area of influence. An airport sponsor with land use authority (provided by state law or owning city or county) should ensure compatible land use is maintained and protected in the airport environs, typically by enforcement of adequate zoning code within the airport area of influence (see Appendix F for sample airport overlay zoning ordinance). If the airport sponsor or owner is not the local land use authority (adjoins other independent jurisdictions, etc.), the sponsor should still pursue cooperation with their neighboring land use authorities to advocate the airport interest for compatible land use and development.

3.3.1.2 Whether the local land use authority or not, the airport sponsor is expected to promote and facilitate compatible land use decisions locally in a variety of ways. This includes attendance at public meetings and participation on local land use and development committees, either as a member or as a guest speaker to promote airport compatibility. The sponsor can take the time and provide needed information and resources about airport land use compatibility, development initiatives at the airport, and the economic impact of the airport. The sponsor should advocate for the airport in the larger community and build a reputation as a valuable resource to the community. Through active involvement in the local government activities, the airport sponsor will be in a position to be informed and involved in the early stages of planning, and will be able to work cooperatively with the local government.

3.3.2 Airport Manager.

3.3.2.1 The airport manager is the airport stakeholder in the best position to keep watch for local land use issues in the adjacent communities and the surrounding areas. The airport manager can strengthen relationships with local planning agencies by providing them with informative airport and aviation documents (e.g., Airport Master Plan, relevant FAA guidance and grant assurance obligations, economic impact studies, ACRP reports, etc.) and by participating in community planning activities and encouraging community participation in airport planning activities. In this role, the

airport manager can be a resource to local planning agencies for information related to land use compatibility. The airport manager should be aware of regular meeting schedules for planning commissions and elected boards, review the agenda prior to the meeting and be prepared to comment on land use related issues that may affect the airport. The airport manager may also be able to participate in the site plan review process associated with the review and permitting of new land use developments. The airport manager should also use available FAA tools such as the Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) website to search for new cases around their airport (https://oeaaa.faa.gov/oeaaa/external/portal.jsp).

3.3.2.2 As part of the community planning review process, the airport manager can support new development that does not create incompatible land uses, endanger the safe operations of the airport or expose the public to excessive noise or risks. This review process for planned development near the airport can often be established by the airport manager working to secure planning coordination with their local planning officials. See Chapter 4 for discussion of the coordination opportunities available to airport sponsors and their local planning agencies.

3.3.3 Airport Users: Airlines, Fixed Base Operators (FBOs) and Local Pilots.

3.3.3.1 Airport users, including airlines, FBOs, and local pilots are another group of airport stakeholders representing a diverse network of people within a community. Airport users may also attend local public meetings concerning proposed zoning and land use changes, and development proposals. Airlines and FBOs, as well as some local aircraft owner/operators, including local pilots, have an economic interest in the airport. They can raise community awareness of the airport as an economic resource and discuss the impacts of incompatibility. Through participation in community conversations, airline staff, FBO staff, and pilots can raise the visibility of the airport as a place of employment and as a valuable service to local businesses travelers, cargo operator needs, and emergency service providers. This can help garner support for land use decisions that prevent incompatible development and preserve the continued safe operation of the airport.

3.3.3.2 In addition to actively promoting land use compatibility, airport stakeholders need to be good neighbors. Pilots, FBOs, and commercial airlines may be in a position to help mitigate or avoid some of the negative effects that aircraft operations can have on adjacent land uses -- especially noise related effects. Airport users can show their support for land use compatibility by participating in efforts to reduce noise, as well as by becoming involved in efforts to prevent new incompatible uses. Specifically, pilots should operate their aircraft in a prudent manner to reduce noise effects on local land uses. This includes adhering to local voluntary noise abatement procedures, and posted traffic patterns during

approach and departure operations. Pilots can show their support for these efforts to the community by attending local noise abatement council meetings.

3.4 Non-Aviation Stakeholders.

3.4.1 In addition to specific aviation interests, there are other non-aviation related stakeholders that should be involved in the planning process. These stakeholders may include those that support aviation activities such as shipping companies, parking services, rental car companies, utilities, taxi/car services, cargo handling services, and local transit agencies. Additionally, there are business stakeholders that locate near an airport due to economic gains as a result of their location, such as hotels, restaurants, and industrial users. Often these stakeholders have significant interest in land use surrounding the airport, and its potential impact to the airport and airport business.

3.4.2 Organized Groups / Non-governmental Organizations (NGOs) in the Surrounding Jurisdictions**.**

Local community groups, including business, social and recreational organizations such as civic and volunteer organizations, the Chamber of Commerce, sport clubs, homeowner associations, and so on offer forums for public engagement regarding land use education with a ready-made organizational structure. These groups usually have established meeting times, email lists, newsletters, websites, and other means of getting information out to their membership. The airport manager and airport sponsor can identify these groups in the community and take the initiative to reach out and provide information and education about airport land use compatibility. Airport managers and sponsors can develop a presentation that can be given in a meeting setting and text that can be included in newsletters and other written communication. When information about the value of land use compatibility and the value of the airport to the community is shared with interested citizens, they can then influence land use decision making, both individually and collectively.

3.4.3 Residents and Community Stakeholders**.**

3.4.3.1 Local citizens – individually and organized in neighborhood associations - living near the airport can also be a critical partner in the land use planning process because they directly influence the decisions made by local planners, elected officials, and other policymakers. Local citizens can also bring an important perspective to the community conversation in their personal role as neighbors, travelers and employees. Public education about land use compatibility on or near airports will help establish open lines of communication between all parties and set the stage for future dialogues. When the local residents understand how the airport and surrounding areas interact, they can participate more effectively in an airport compatible land use and development conversation.

3.4.3.2 The airport manager and the airport sponsor may provide the needed education and outreach to the local residents, neighborhood organizations, and community interests to support coordination on airport and community compatible land use planning programs. Informed residents will challenge land use development proposals that potentially conflict with airport safety, expand noise exposure, or create adverse economic impact to their community. Informed residents are more likely to accept proposals shown to represent mutually compatible development.

3.4.3.3 Community leaders, frequent travelers, and local business owners can each bring a unique view of the relationship between the airport and its environs, and may offer different perspectives on the economic value of the airport or noise impacts. Members of the public can raise awareness of land use compatibility issues at public meetings, through social media, or in the press, and can challenge decision-makers to address potential safety, noise or economic impacts.

3.4.4 Real Estate and Development Interests.

3.4.4.1 Real estate professionals in a community, both businesses and individuals, should be included in the compatible land use discussion. As the agent and professional market consultants for landowners and development interests, realtors are in a position to be responsive stewards for compatible land use and development at the airport, and the market area around it. In order to fill this role, real estate professionals need to be educated about land use compatibility and the effect a nearby airport can have on different types of land use and development. They can be included in local land use planning discussions as a member of the planning commission, a participant in a focus group, or a speaker at a public meeting.

3.4.4.2 Their participation may be especially valuable because they can often speak from experience about the effect of noise over residential properties, and they understand tools such as avigation easements and disclosure notices. These tools are available to encourage land use compatibility as a part of property sales near an airport or in the approach areas, and are used to alert developers or a future tenant to potential compatibility concerns before development takes place. In some cases, education alone may be enough to encourage real estate developers to implement compatible land use strategies. A shift away from the concept of “caveat emptor” (buyer beware) places more legal responsibility on the realtor and selling owner to represent the property fairly and accurately to buyers. In some states, laws require disclosure of airport noise or location (as well as other environmental issues) in real estate purchase contracts.

3.5 State Government Stakeholders.

Agencies at the state level can support airport compatible land use planning efforts in many ways, such as providing funding for airport sponsors to develop land use compatibility plans and supporting legislation that requires or encourages land use planning efforts for communities with airports. Coordination with state agencies is important to align compatibility efforts at all levels. The following sections discuss common state agencies that can impact airport land use compatibility and should be consulted with as appropriate.

3.5.1 State Aeronautical Departments.

Each state has its own unique combination of authorities and resources that can help support local airport sponsors in the pursuit of compatible land use within the vicinity of airport property. State level guidance and support from each state aeronautical department can promote land use compatibility through initiatives ranging from information and education, to voluntary land use guidance, to mandatory land use requirements. State and local funding of compatible land use planning and zoning efforts is available in some states.

3.5.2 Other Agencies.

3.5.2.1 Many state departments and agencies can affect land use compatibility planning if their areas of interest and expertise overlap with the aviation sector. Communication and coordination between the aeronautics departments and other agencies can help to align land use compatibility guidance and other program goals.

3.5.2.2 Other state agencies should be included in the dialogue because of the potential to align land use compatibility and other development goals. The specific name and role of the departments will vary depending on the specific structure of the individual state governments. In general, however, the following agencies should be considered:

- Departments of Agriculture: In many cases, agriculture is compatible with airport operations. However, open water sources and crops that provide food and shelter for wildlife may increase wildlife hazards when they are located near airports. The state department of agriculture can work with the agricultural community to discuss land use compatibility and address issues, especially as it relates to minimizing wildlife hazards.

- Departments of Economic Development: Typically, a state department of economic development has many tools to encourage new commercial and industrial development including economic incentives (i.e. grants) and marketing functions. Policymakers in this department can encourage growth in places that will be compatible for both the business and the airport operations. They can also help promote the economic value of the airport as a business development tool.

- Departments of Environmental Quality or Management: This department is normally responsible for the implementation and regulation of a host of environmental features, including some related to water such as wetlands and floodplains. Because open water is also a wildlife attractant, environmental regulations can work at cross-purposes with the safety needs of the airport. The state environmental department can help identify solutions that encourage land use compatibility and environmental goals.

- Departments of Historic Preservation: Typically, the state historic preservation office is tasked with preserving structures that meet established criteria. These criteria may impact actions that could address compatible land uses. For instance, a structure may be a hazard to airport operations. This office may also review National Environmental Policy Act (NEPA) documents for certain airport development projects.

- Departments of Community Health and/or Human Resources: These departments may be involved in siting new institutional and health care facilities. There may be land use compatibility concerns with these facilities when they are near an airport. Engaging these departments in dialogue about land use compatibility in the early planning stages can help alleviate those concerns.

3.5.2.3 Likely, other state agencies will need to be consulted beyond the ones listed above. Consultation is on a case-by-case basis.

3.6 Federal Government Stakeholders.

While the FAA is the primary agency responsible for airport-related land use issues, other federal agencies are also involved in more limited ways because they have an impact or decision-making authority over issues that directly or indirectly affect land use issues. Much like the various state agencies discussed in Section 3.8, a number of federal agencies may have a role or responsibility to regulate and review various aspects of airport development and land use compatibility issues.

3.6.1 DOT, Federal Aviation Administration (FAA).

3.6.2 The U.S. Department of Transportation (DOT), the parent organization of the FAA, has a mission that is focused on the transportation of people and goods by highway, rail, air and other modes. In some instances, federal actions regarding other modes of transportation can affect airport land use compatibility. The FAA can coordinate with the other DOT modal administrations on these projects.

3.6.3 The FAA is the primary agency responsible for federal guidance relevant to land use compatibility as it relates to the national aviation system. In some instances, the development of other types of transportation infrastructure can raise issues or conflicts with aviation facilities, which needs to be considered carefully. Conversely, there may

be mutual benefit in some instances where careful and coordinated multimodal planning can provide synergistic benefits to both aviation and surface transportation, which in turn can greatly benefit a community or region. Such issues should be explored as early as possible in the planning process.

3.6.4 Title 14 of the Code of Federal Regulations (CFR), FAA Orders, and FAA Advisory Circulars (AC) are the primary tools FAA uses at the national level to preserve, protect, manage, and grow the national air transportation system.

3.6.4.1 The FAA guides land use compatibility through funding programs in several ways. For airports that are part of the National Plan of Integrated Airport Systems (NPIAS), the Airport Improvement Program (AIP) can provide funding for master planning, land acquisition (including fee simple and avigation easements), and noise related mitigation measures. FAA Order 5100.38, *AIP Handbook*, provides guidance and sets forth policy and procedures used in the administration of the AIP (and can be found on FAA's website at https://www.faa.gov/airports/aip/aip_handbook/).

3.6.4.2 Airport sponsors may accept AIP grant funding for eligible airport planning and development. FAA funding provides a contractual aspect to land use compatibility through the airport sponsor's grant assurance obligations to FAA. When accepting an AIP grant, the airport sponsor agrees to maintain safe and compliant airport use and operations conforming to FAA grant assurances—including agreeing to protect their airport from incompatible land uses. As well as an obligation to be vigilant to prevent incompatible development, FAA grant funding can be an important incentive to promote airport land use compatibility with their local land use and development community.

3.6.4.3 The FAA provides guidance for establishing airport planning and design standards that are important to the overall planning process. This includes the creation of a master plan and the development of an Airport Layout Plan (ALP). Additionally, system planning, airspace review, and general education of stakeholders are also supported by FAA guidance documents, as well as direct staff involvement when requested or required. A discussion of these guidance documents and their associated use in the planning process is included in Chapter 4.

3.6.5 Department of Defense (DOD).

With branches including the Air Force, Army, Navy and others, the Department of Defense (DOD) often has operational areas both on the ground and in the air that can affect civilian airport operations with regards to approaches and flight routes. Coordination with them is crucial to ensuring compatible land use and development.

3.6.6 Army Corps of Engineers (Corps).

The Corps often becomes involved in airport land use compatibility planning when an airport is near significant bodies of water, has extensive wetland impacts or has development near navigable waterways. Because the Corps has a fundamentally different set of statutory authorities and obligations, early coordination is crucial to finding mutually acceptable solutions.

3.6.7 Department of the Interior (DOI).

DOI has a wide range of responsibilities including wildlife (e.g., threatened and endangered species, migratory birds), wilderness areas and wildlife refuges, and national parks. Agencies within DOI (e.g., the U.S. Fish & Wildlife Service, National Park Service, Bureau of Land Management, etc.) may have an interest in land use planning that protects natural resources in the vicinity of airports and may have a formal role in some situations (e.g. Section 7 consultations under the Endangered Species Act).

3.6.8 Environmental Protection Agency (EPA).

This agency provides national guidance and oversight for a number of environmental topics that often have direct implications on airport facilities (*e.g.*, deicing, wetlands, storm water runoff, air quality, etc.). The EPA establishes standards and regulations under many environmental statutes, such as the Clean Air Act, the Clean Water Act, and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, more commonly known as Superfund). In many cases, EPA delegates implementation of these programs to the states. EPA also has a mandate to review environmental impact statements (EIS) prepared by all federal agencies under NEPA.

3.6.9 Federal Communication Commission (FCC).

The FCC can often be a partner with the FAA when addressing issues such as cellular towers and radio navigation. Coordination with them regarding the location of cellular towers or other communication-based towers that extend into the national airspace system is critical.

3.6.10 Other Federal Agency Stakeholders for Compatible Land Use Planning.

Other federal agencies that have development programs can have specific interests in airport compatible land use planning efforts and can participate in the process. These agencies include the Department of Agriculture, Department of Energy, Department of Health and Human Services, and the Department of Housing and Urban Development.

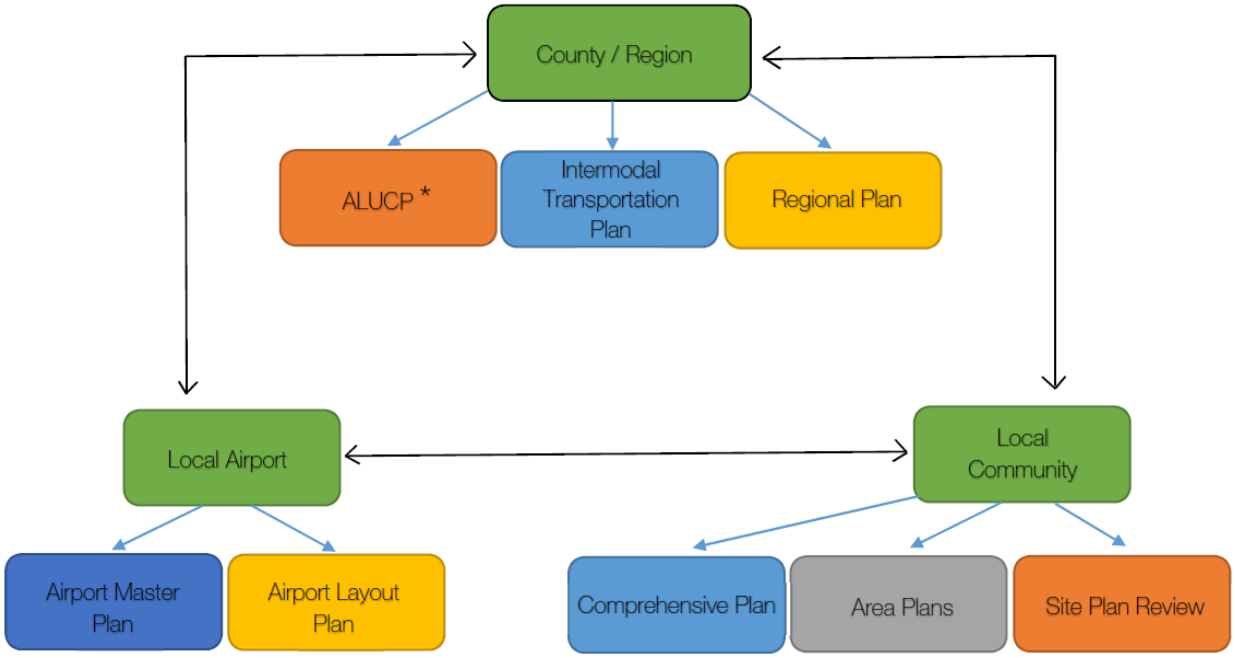
CHAPTER 4. AIRPORT AND LOCAL LAND USE PLANNING COORDINATION

4.1 Airport and FAA Participation in Local and Regional Planning.

4.1.1 Airports, local governments, and regional planning agencies are all responsible for the preparation of long-range development plans. These plans establish the fundamental policies intended to guide development decisions through the future. **Table 4-1** on the following page lists the planning documents and processes that are reviewed in this chapter that are generally applicable to the airport and land use planning discussion.

4.1.2 **Figure 4-1** below illustrates the relationship between the local airport, the community, and the larger region as it relates to these plans. Coordination among the airport sponsor, various FAA offices (ADOs and Regional Offices), local governments, and regional planning agencies is important to ensure that these plans, to the extent they influence airport-vicinity development, are coordinated and help to promote airport land use compatibility.

Figure 4-1. General Relationship of Planning Strategies



* ALUCP – Airport Land Use Compatibility Plan
(if applicable – predominantly applies to airports in California)

1976 **Table 4-1. Airport, Local Government, and Regional Planning Documents and Processes**

Sec.	Tool	Agency	Description/ Function
Airport-Sponsored			
4.2.1	Airport Master Plan & Airport Layout Plan (ALP)	Airport	The master plan is a narrative report that documents the airport's existing conditions and projects future growth and development needs. The ALP is a graphic report that documents the existing and future configuration and development of an airport.
4.2.1	14 CFR Part 150 Noise Compatibility Programs	Airport	A Part 150 Noise Compatibility Program evaluates and implements voluntary noise mitigation techniques inside and outside the property boundary to enhance compatibility with surrounding land uses. The Part 150 process is entirely voluntary on the part of the airport. There are over 250 airports nationwide that have elected to implement FAA approved Part 150 noise compatibility programs.
Military-Sponsored			
4.3.1	Air Installation Compatible Use Zone Studies (AICUZ)	Department of Defense	The Air Installation Compatible Use Zone (AICUZ) program promotes compatible land development in areas surrounding military air bases subject to aircraft noise and accident potential.
4.3.2	Joint Land Use Studies (JLUS)	Department of Defense	The Joint Land Use Study (JLUS) is designed to identify encroachment issues confronting a military installation and civilian community, as well as to recommend strategies to address the issues in the sponsoring community's comprehensive plan and zoning regulations.
Regional Plans			
4.4.1	Intermodal Transportation Plan	Region	A long-range transportation plan to meet the mobility needs of people and businesses throughout a metropolitan area or region including multimodal investment strategies.
4.4.2	Joint or Regional Plans	Region	A plan completed jointly, or cooperatively, by more than one community, often created to address a resource that spans across several communities. This can be an effective way to address land use effects and compatible land use needs of an airport.
4.4.3	Airport Land Use Compatibility Plan	Region	A plan to promote compatibility between airports and the land uses that surround them; required by law in California.

Sec.	Tool	Agency	Description/ Function
Local Government Plans and Activities			
4.5.1	Comprehensive Plan / General Planning	Local Community	A strategic long-range plan that documents the community's existing conditions and projects future growth and development needs.
4.5.2	Area Plans	Local Community	A plan adopted as part of a community's master plan that focuses on a specific geographic area (i.e., neighborhood, downtown) or specific topic (i.e., transportation, recreation). An Airport Master Plan can be adopted as an area plan by the community.
4.5.3	Development Site Plan Reviews	Local Community	The review and approval of the physical site design of a proposed development by the planning commission including building location and height, parking layout, drainage, lighting and landscaping.
4.5.4	Planning Forums	Local Community	Formalized staff committees of local government planners and airport staff to review and discuss development trends and specific projects.

4.1.3 The authorities to develop, implement, and enforce land use programs and decisions rest predominantly with local governments. The FAA advises airport operators to be involved in the preparation of city and county comprehensive plans so that they can advocate for airport interests and provide their specialized expertise to the planning team. The FAA can also be a helpful partner in comprehensive planning to the extent that airport and aviation interests are affected. By providing authoritative information about the scope and limitation of the federal role in land use compatibility and airspace protection, the FAA can provide information needed to encourage local governments to exercise the degree of planning and regulatory control needed to protect the airport.

4.1.4 The FAA encourages airport operators to be vigilant and coordinate with local governments to ensure that they are routinely given information about proposed development activity in the airport environs. An airport's area of influence, including airspace, noise impact area, and areas of safety concern can cross multiple jurisdictions, so it is important that the airport operator engage with all affected jurisdictions.

4.1.5 Effective coordination allows airport operators the opportunity to review and comment on those proposals. In areas subject to considerable development pressure, local government planners and airport staff can create formal staff committees that meet regularly to review and discuss development trends and specific projects. In addition to building important relationships among the participants, this coordination can improve the likelihood that airport compatibility considerations are addressed early in the development process. It also gives the airport operator the opportunity to keep local government officials informed of airport improvement and development projects in a timely manner.

4.2 Airport-Sponsored Plans.

Two key plans create a blueprint for the future development of airport facilities. These include the Airport Master Plan (which evaluates current and future airport use, among other factors) and Airport Layout Plan (which graphically depicts airport facilities, as they exist today and are planned for the future). In additional to these two plans, the 14 CFR Part 150 Noise Compatibility Program, can evaluate current and anticipated airport noise exposure levels around an airport in order to address measured noise impacts on noise sensitive land use. Following are descriptions of these plans.

4.2.1 Airport Master Plans and Airport Layout Plans (ALPs).

4.2.1.1 The guiding principle of the airport planning process is to develop a safe and efficient airport through the use of acceptable planning standards. The Airport Master Plan and Airport Layout Plan (ALP) are the two primary planning resources that discuss the existing conditions of an airport, as well as project future growth and development. The Airport Master Plan is a narrative report that describes the existing conditions at the airport, forecasts future use and facility needs, and provides a narrative justification for proposed development. The ALP documents the existing and future configuration and development of an airport in a graphic manner. ALPs are required for those airports that are part of the National Plan of Integrated Airport Systems (NPIAS). A master plan report is recommended for those airports that anticipate future growth. Every federally obligated airport is required to maintain a current ALP as a condition of its grant assurances.

4.2.1.2 Airport Master Plans follow the guidelines set forth in FAA AC 150/5070-6, *Airport Master Plans.* Acceptable Airport Master Plans should aim to include, at a minimum, an inventory of existing conditions, aviation forecasts, alternatives development, a capital improvements plan and public involvement. Airports are encouraged to involve the FAA in the master planning process, to provide continuity prior to ALP development airspace reviews. FAA's role is to provide guidance and technical information on current standards and initiatives, as well as to approve the aviation forecast. FAA does not approve but instead accepts an Airport Master Plan report meeting applicable FAA requirements. The FAA does, however, review and approve the aviation forecast, and reviews and approves each airport’s Airport Layout Plan in accordance with the FAA’s authorizing statute.

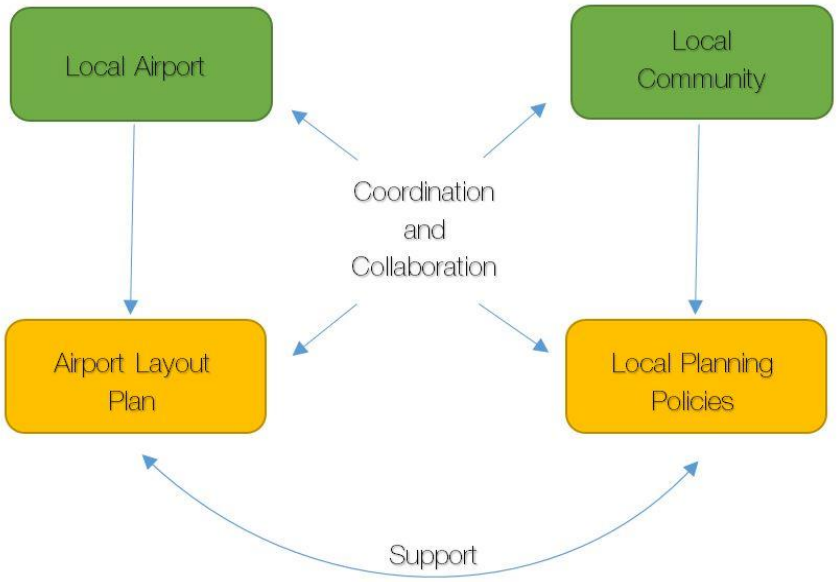
4.2.1.2.1 The ALP illustrates the airport boundaries, including all existing and planned facilities as discussed in an Airport Master Plan or indicated in a planning process that may not be part of a master plan report. An ALP is the culmination of the planning process and details the planned growth and development for an airport typically over a 20-year planning horizon. One of the sheets in an ALP is the "Land Use Plan," which indicates the current land uses around an airport, outside of the airport property line. This information is helpful in understanding existing and potential future conditions, however it is not intended to govern or regulate land uses

around an airport. While it is not a mechanism to achieve compatibility on its own, it can be shared with the local elected/appointed bodies to help them be better informed about the airport.

4.2.1.2.2 The local community, including planning agencies and administrators (e.g., the Mayor's office, City Council), should be invited to participate in an airport's planning process so the community is informed about the airport's long-term development plan. An ALP should be available and shared with local communities to inform them about an airport's plans for development. By having a chance to provide input on the long-term development plans of an airport, the community can inform the FAA of concerns or information before projects are initiated. This should be a two-way communication process: the community should have an opportunity to contribute to the process and be informed about how their input was considered.

4.2.1.2.3 **Figure 4-2** illustrates the ideal relationship between an airport and its local community in developing coordinated plans and policies that promote compatibility. The community can also coordinate with an airport in planning for other systems that serve the airport such as public utilities, local streets, transit service, and public safety and emergency response teams. AC 150/5050-4, *Citizen Participation in Airport Planning,* provides guidance for airports to engage the local community in airport planning efforts (such as ALP development), and tools and techniques to encourage participation. Airports are encouraged to blend the recommendations provided in this updated AC into their master planning process.

Figure 4-2. Planning Relationships that Promote Compatibility



4.2.2 14 CFR Part 150 Noise Compatibility Programs.

The Aviation Safety and Noise Abatement Act (ASNA) required the FAA to: 1) establish a single system of measuring noise; 2) establish a single system for determining the exposure of individuals to noise resulting from airport operations; 3) identify land uses normally compatible with various exposures of individuals to noise; and 4) to address noise impacts on existing incompatible uses. The resulting federal regulation, 14 CFR Part 150, *Airport Noise Compatibility Planning*, prescribes the procedures, standards and methodology governing the development, submission, and review of airport noise exposure maps (NEMs) and airport noise compatibility programs (NCPs), including the process for evaluating and approving or disapproving those programs. The Part 150 process is entirely voluntary on the part of the airport. However, many airports have reaped significant benefits from the process, which provides a structured approach to collaboration between the airport, airlines and other user groups, neighboring communities and the FAA (including air traffic controllers and the specialists who design the arrival and departure paths for aircraft in flight). Also see AC 150/5020-1, *Noise Control and Compatibility Planning for Airports*, for FAA guidance for sponsor development and implementation of noise compatibility programs developed for FAA approval under 14 CFR Part 150.

4.3 Military-Sponsored Plans.

Communities that are home to military air bases have two main planning studies that are sponsored by the Department of Defense. The goal of these studies is to promote compatible uses (military and civilian) near the military installations to maintain safe military air operations. Section 4.3.1 and Section 4.3.2 provide additional information on each of these studies.

4.3.1 Department of Defense Air Installation Compatible Use Zones (AICUZ) Studies.

The Air Installation Compatible Use Zone (AICUZ) program promotes compatible land development in areas surrounding military air bases subject to aircraft noise and accident potential. The AICUZ studies describe three basic types of constraints that affect or result from aircraft operations, including height restrictions, noise zones, and accident potential zones. They also include a list of land use guidelines. The AICUZ zones are similar to civilian airport overlay zoning districts, although the accident potential zone is derived from military accident data and does not necessarily correlate with the dimensions established for the Runway Protection Zone (RPZ) described in FAA design standards.

4.3.2 Department of Defense Joint Land Use Studies (JLUS).

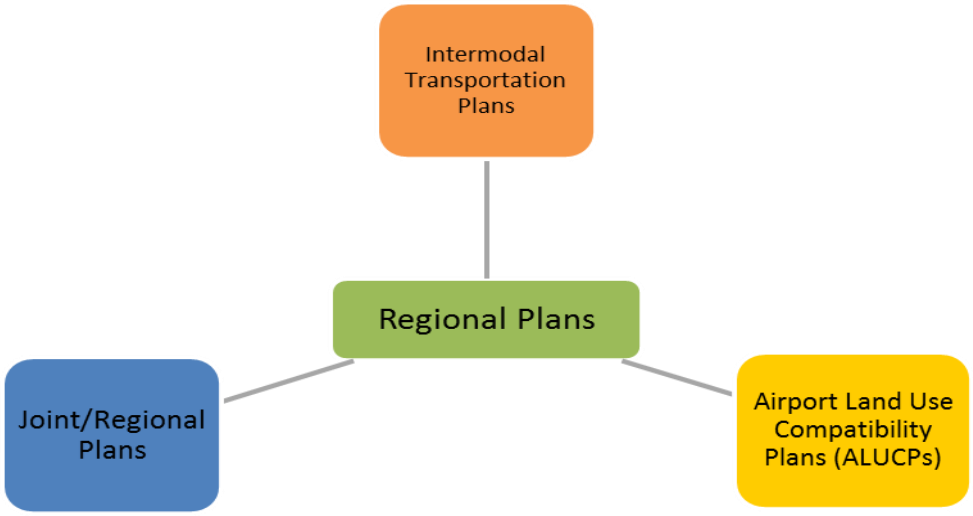
The Joint Land Use Study (JLUS) is a basic planning process designed to identify encroachment issues confronting a military installation and civilian community, as well as to recommend strategies to address the issues in the sponsoring community's comprehensive plan and zoning regulations. A JLUS is produced by and for a local jurisdiction (or multiple jurisdictions) where the military installation is located. It is intended to benefit both the local community and the military installation by combining the AICUZ program with the JLUS program. According to the 2006 Joint Land Use

Study Program Guidance Manual, the JLUS is conducted in a collaborative manner involving a number of stakeholders, such as local elected officials, planning commissioners, local military base command staff, community business leaders, chambers of commerce, homebuilders, real estate interests, and affected residents.

4.4 Regional Plans.

Airports can affect areas much larger than the immediate surrounding area. As shown in **Figure 4-3**, communities may work together on a regional planning level.

Figure 4-3. Common Regional Plans



4.4.1 Intermodal Transportation Plans.

4.4.1.1 The national airspace system is part of a larger transportation network that includes highways, local streets, rail, ports, transit and non-motorized transportation. As such, airport administrators should be part of multimodal transportation planning efforts. Metropolitan Planning Organizations (MPOs) are often the agencies responsible for developing long-range transportation plans with multimodal investment strategies. The airport planning process should be conducted in coordination with local MPOs (if applicable) in order to meet the mobility needs of people and businesses throughout a metropolitan area.

4.4.1.2 Trips using air transportation also include other modes of transportation from origin to final destination. Options for local ground transportation access to an airport are important for business and leisure travelers as well as airport employees. Connections to the highway system, shipping ports and rail lines are important for the movement of cargo. For these reasons, the aviation mode should be included in the intermodal planning process.

Multimodal planning efforts are encouraged to allow for greater development of the transportation systems that take advantage of the existing infrastructure, as well as the future needs of these systems.

4.4.2 Joint / Regional Plans.

Regional plans are completed jointly, or cooperatively, by more than one community. Communities choose to join together to produce regional plans for a variety of reasons. Often the reason or the driver is a resource that spans across several communities. Examples of this include watersheds, non-motorized trail systems, and regional transit. Airports also have impacts beyond one local community even if they are located within in a single jurisdiction. As a result, regional or joint plans may be appropriate to address airport land use concerns. Regional planning for airports can be an effective way to address land use effects and compatible land use needs of an airport.

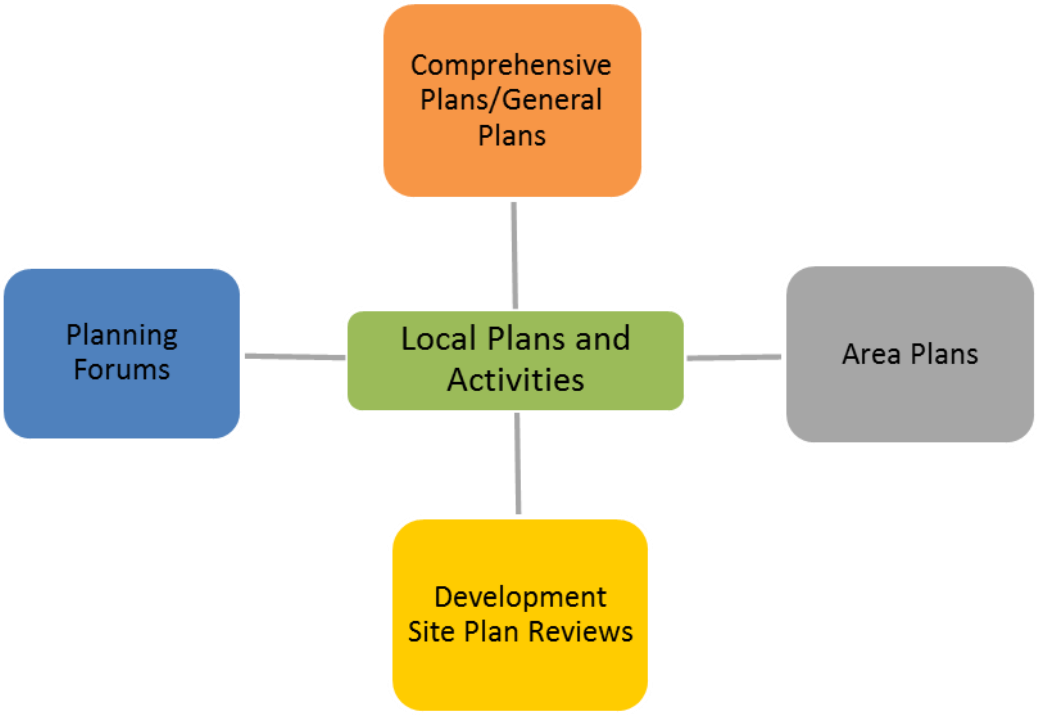
4.4.3 Airport Land Use Compatibility Plans.

An Airport Land Use Compatibility Plan (ALUCP) is a term given to a specific plan developed to look at compatibility around an airport. The State of California requires counties that have public use airports to develop ALUCPs. Airport Land Use Commissions (ALUCs) are tasked with overseeing them. The basic function of an ALUCP is to promote compatibility between airports and the land uses that surround them, and therefore it is a tool that can be used at airports of all sizes and types across the country – not just in California. The plan needs to define an airport influence area or other planning boundary that is large enough to protect an airport and persons on the ground around it. The FAA recommends that it also contain federal and state airport design criteria, safety areas, noise areas, and overflight areas with land use controls unique to the local community. Through due diligence in implementing the guidelines included in an ALUCP, communities can accommodate compatible growth and development of airports while still allowing for growth and development in the community. These ALUCPs are not regulatory documents, rather they provide background and framework to support or guide the implementation of an airport zoning ordinance, which is the regulatory document. Appendix E provides a checklist of ALUCP content and links to some existing commission plans.

4.5 Local Governments Plans and Activities.

The local government often has a variety of planning processes and documents that are in place to help guide growth according to the values and vision of the community. These plans can incorporate airport-sponsored planning efforts (see Section 4.2) and vice versa to align airport compatible land use needs with community growth. Information on the four common local plans and activities shown in **Figure 4-4** is provided in the following sections.

Figure 4-4. Common Local Plans and Activities



4.5.1 Comprehensive Planning / General Planning.

A local comprehensive plan, also called a general plan in some states, is a strategic long-range document that sets forth policies for a community's long-term growth and development. A comprehensive plan generally includes maps, charts, and text to explain a plan's goals and objectives. The purpose of traditional comprehensive planning and general plans is to provide for organized community growth, development, and land use. These plans are well suited to incorporate airport elements. Local comprehensive plans should reference local Airport Master Plans and ALPs or even adopt the Airport Master Plan as an area plan (see Section 4.5.2). This will set the stage for local land use decision makers to make coordinated decisions regarding compatible land use around an airport's jurisdictional boundary. The importance of an Airport Master Plan and associated ALP is highlighted when a local municipality recognizes the documents as part of the comprehensive plan.

4.5.2 Area Plans.

A community comprehensive/general plan may include area plans that address specific geographic areas such as individual neighborhoods or Central Business District (CBD) areas, or specific topics such as roads or recreation. Because area plans have a more narrow focus, they also provide a higher level of planning detail. An Airport Master Plan can be adopted by a community as an area plan for an airport and the surrounding affected areas, depending on local regulations. The additional detail provided by airspace protection zones and noise contours can set the stage for more detailed land use regulations for compatible land use around an airport.

4.5.3 Development Site Plan Reviews.

Approval by the local planning commission with a site plan approval is usually required for new development in a community (other than low density, single-family housing). Site plan approval is the review and approval of the physical site design, including building location and height, parking layout, drainage, lighting, and landscaping. Uses with off-site effects such as smoke, glare, or vibration usually require a conditional use permit (or "special use permit"). A conditional use permit allows the local jurisdiction to place operating restrictions on the proposed use as a condition of approval. The permitting process can address airport land use compatibility through a general performance statement (i.e. must be compatible with airport operations) or through specific design standards. As part of site plan review, comments are often requested from service providers and regulatory agencies. Through this same process, an airport manager or an airport sponsor could also be asked to review and comment on the site plan. Whether it is general performance standard, specific site development standards, or direct engagement from the airport administration, there are several ways the site plan review process can be used to review or even guide new development.

4.5.4 Planning Forums.

In areas subject to considerable development pressure, formalized staff committees of local government planners and airport staff can be formed to meet regularly to review and discuss development trends and specific projects. In addition to building important relationships among the participants, this coordination can improve the likelihood that airport compatibility considerations can be addressed early in the development process. It also gives the airport operator the opportunity to keep local government officials informed of airport improvement and development projects in a timely manner.

CHAPTER 5. TOOLS AND TECHNIQUES FOR LAND USE COMPATIBILITY

5.1 Overview of Tools and Techniques.

5.1.1 Many tools and techniques have been developed over the years to promote airport land use compatibility. Unfortunately, in many instances these tools and techniques go unused by local communities and airports. Some tools have proven to be effective in many different settings; others are highly specialized and are suitable only in special cases. The key stakeholders in the land use compatibility planning process – airports and local governments (and, to a lesser extent, regional planning agencies) – have access to different sets of tools, which can be utilized. Effective airport land use compatibility usually depends on the cooperation of these stakeholders in designing a comprehensive system of land use compatibility plans and regulations.

5.1.2 The selection of appropriate tools and techniques should follow comprehensive airport and land use planning processes, as described in Chapter 4. The plans developed through those processes provide the overall policy direction that is essential to structuring appropriate land use compatibility initiatives and building the public support needed to implement those initiatives. If land use regulations to promote airport land use compatibility are envisioned, the FAA advises that the rationale and the basis for those regulations be clearly documented in airport and land use compatibility plans for the regulations to withstand legal scrutiny.

5.1.3 **Table 5-1** lists the tools and techniques that are briefly discussed in this chapter. For each tool or technique, the entity with primary implementation authority is noted, as are the land use compatibility factors that can be most effectively addressed through the use of the tool or technique. Application/implementation of any of these tools should be assessed on a case-by-case basis to address specific airport and community needs. In many instances, more than one tool or technique may be required.

2248 **Table 5-1. Overview of Land Use Compatibility Tools and Techniques**

Tool/ Technique	Entity with Primary Authority	Potential Compatibility Concerns Addressed				
			Safety			
		Noise	Concentrations of People	Wildlife Attractants	Airspace	
					Tall Structures	Visual & Atmospheric Issues
Land Use Regulations						
Overlay Zoning	Local government	X	X	X	X	X
Compatible Use Zoning	Local government	X	X	X	X	X
Standalone Airport Zoning	Local government or, in some states, airport operator	X	X	X	X	X
Transfer of Development Rights	Local government	X	X	X	X	X
Subdivision Regulations	Local government	X	X			
Building Codes	Local government	X	X		X	
Project Review Standards	Local government	X	X	X	X	X
Property Acquisition Techniques						
Fee Simple Acquisition	Airport operator	X	X	X	X	X
Purchase Options, Land Contracts, Life Estates	Airport operator	X	X	X	X	X
Avigation Easements	Airport operator	X	X	X	X	X
Purchase of Development Rights	Airport operator	X	X	X	X	X
Conservation Easements	Airport operator	X	X	X	X	X
Lease or Sale of Airport Land Subject to Compatible Use Conditions	Airport operator	X	X	X	X	X
Noise Mitigation Techniques						
Sound Insulation	Airport operator or local government	X				

Tool/ Technique	Entity with Primary Authority	Potential Compatibility Concerns Addressed				
			Safety			
					Airspace	
		Noise	Concentrations of People	Wildlife Attractants	Tall Structures	Visual & Atmospheric Issues
Sound Barriers	Airport operator	X				
Environmental Management Techniques						
Wildlife Hazard Management Plans	Airport operator			X		
Natural Features Inventory and Mitigation	Airport operator			X		
Notification Techniques						
State-mandated Fair Disclosure*	State legislature	X	X			
Deed Restrictions	Local government		X	X	X	X
Nonsuit Covenants and Hold Harmless Agreements	Local government	X	X			X
Disclosure Notices	Local government	X			X	
Education and Communication Techniques						
Community Outreach	Airport operator	X		X	X	X
Local Government Involvement	Airport operator	X	X	X	X	X
Outreach to Airport Users	Airport operator	X				
Airport and FAA Participation in Local and Regional Planning	Airport operator	X	X	X	X	X
Airport and FAA Participation in Professional Planning Organizations	Airport operator	X	X	X	X	X
Coordination with Real Estate Agents and Brokers	Airport operator	X	X		X	
Use of Social Media	Airport operator	X		X	X	X
Use of Focus Groups	Airport operator	X	X	X	X	X

Tool/ Technique	Entity with Primary Authority	Potential Compatibility Concerns Addressed				
		Noise	Safety			
			Concentrations of People	Wildlife Attractants	Airspace	
					Tall Structures	Visual & Atmospheric Issues
Education of State Legislators and Legislative Staff	Airport operator	X	X	X	X	X

*Legal Research Digest 12 Fair Disclosure and Airport Impact Statements in Real Estate Transfers.

5.2 Land Use Regulations.

Local governments are empowered by state law to exercise land use regulatory power to promote the public health, safety, and welfare. Zoning can be one of the most effective ways to achieve land use compatibility near airports, because it regulates (by allowing or prohibiting) specific land uses in defined areas. Land use regulations are powerful tools for promoting airport land use compatibility, because they can regulate specific land uses and require development conditions to mitigate potential adverse effects on airports and aviation in defined areas. Most often, local land use regulations are enacted and administered by the municipality in which an airport is located (or by the county if the airport is in unincorporated territory). Zoning, the most powerful of the land use regulatory tools, can be used to both regulate land uses and land use characteristics, such as building height, bulk, site orientation, and design features. **Table 5-2** summarizes the types of land use regulations that can be used to foster compatible development near airports. Each is discussed in the following sections.

2265 **Table 5-2. Land Use Regulatory Tools and Techniques**

Technique	Description	Key Value	Primary Shortcoming	When to Use
Overlay Zoning	Supplements the provisions of underlying zoning by prohibiting incompatible uses and placing conditions on potentially sensitive land uses.	Reduces the potential for development of hazards and incompatible land use.	Has limited effect on existing incompatible land use.	In undeveloped areas and in areas where infill and redevelopment is possible to protect against future incompatible uses.
Extraterritorial Zoning	Municipal zoning authority extended out to adjoining jurisdictions within the airport influence area.	Creates a unified land use compatibility regulatory structure throughout a larger part of the airport influence area than would otherwise be possible.	Can be politically sensitive. Requires coordination between municipality and other entities to ensure effective administration.	Where authorized by state law and where the municipalities involved are unable or unwilling to establish airport land use compatibility zoning.
Compatible Use Zoning	Conventional zoning for compatible commercial or industrial use.	Readily understood by the public, developers, and elected officials. Most uses allowed in these zoning districts are airport-compatible.	Unsuitable for very large areas, because demand for those uses is likely to be insufficiently strong. Zoning districts may also allow certain sensitive uses (such as noise-sensitive institutions).	Where there is realistic opportunity for industrial or commercial development. Should be supplemented with overlay zoning when possible.

Technique	Description	Key Value	Primary Shortcoming	When to Use
Standalone Airport Zoning Ordinances	Special ordinances specifically intended to regulate obstructions and, sometimes, land use around airport.	Typically, state enabling legislation provides for a multi-jurisdictional structure, ensuring that the regulations can extend throughout an airport influence area.	Often, state legislation allows only for the regulation of potential hazards and obstructions. Requires a strong lead administrative agency and close coordination among participating jurisdictions. Limited effectiveness in situations where incompatible development already exists around an airport.	When airport influence area includes several jurisdictions and where the likelihood of close coordination among the jurisdictions is good.
Transfer of Development Rights	A zoning system allowing property owners in defined zones to buy rights for additional development density or intensity from property owners in designated sending zones to remove density from the primary location.	Allows buildable value to be shifted to a different site, maintaining taxable property.	Complex system that requires highly expert technical analysis to ensure that the original allocation of development rights is appropriate to achieve the desired effect.	Appropriate in high-growth areas with sophisticated developers and planning agencies.
Subdivision Regulations	Regulations governing the division of land, the dedication of public rights-of-way, and utility easements.	Provides a means to secure avigation easements and require fair disclosure measures for development in airport-impacted areas.	Often the limited scope does not allow the direct regulation of land uses.	Where airport influence areas include substantial amounts of undeveloped land.

Technique	Description	Key Value	Primary Shortcoming	When to Use
Building Codes	Regulations governing building materials and methods. May include standards for the sound insulation of noise-sensitive buildings.	Provides clear standards ensuring that noise-sensitive buildings are properly treated to attenuate outdoor noise and non-reflective building materials are used to reduce glare.	Proper construction and installation of materials requires rigorous attention to detail, necessitating thorough building inspection. May increase cost of construction.	Where the development of land uses is expected within noise exposure areas or approach paths.
Project Review Standards	Standards and guidelines for the review of development actions, such as site plan reviews, re-zonings, variances, etc.	Ensures systematic consideration of land use compatibility factors in the review of development proposals subject to approvals.	Effectiveness depends on internal leadership and advocacy in the administering agencies.	Where development activity is expected within the airport influence area.

5.2.1 Overlay Zoning.

5.2.1.1 A zoning overlay is a form of zoning that applies specific standards within an area without changing the basic, underlying zoning of the property. Airport compatibility overlay zoning can be used to impose special standards relating to noise, safety of those on the ground, flight safety, airspace protection, or even disclosure. Within airport compatibility overlay zones, noise-sensitive land uses might be prohibited or conditionally allowed if mitigated (*e.g.*, sound insulated, disclosure, etc.) for compatible use with airport noise exposure. Land use characteristics posing risks to flight safety, such as smoke or water vapor, lighting mimicking airport approach lighting, or bird attractants, can also be prohibited. Height limitations designed to protect critical airspace can also be implemented through overlay zoning.

5.2.1.2 To be legally defensible, overlay-zoning boundaries should be established to correspond to the geographic areas within which the specific impacts of concern occur. That is, noise-based regulation is defined by airport noise contours; height limitations to protect airspace are based on the boundaries of critical airspace, such as 14 CFR Part 77 airport vicinity obstruction

surfaces or TERPS surfaces. See Appendix F for a sample airport land use compatibility overlay-zoning ordinance.

5.2.2 Extraterritorial Zoning.

5.2.2.1 Airports are often located at the edges of their host municipalities. The areas of airport influence, including noise exposure contours and critical airspace, often extend over large areas beyond the boundaries of the host municipalities. Where the areas of airport influence extend into unincorporated areas, some cities, depending on state enabling legislation, are able to exercise extraterritorial zoning control. That is, they are empowered to use their zoning power outside their municipal limits.

5.2.2.2 The exercise of extraterritorial zoning can be an effective way to extend land use compatibility controls across a greater portion of the airport influence area than would otherwise be possible. Coordination with the local government(s) will likely be necessary to ensure that adoption of the regulations is politically acceptable. After adoption, continued coordination between the city and county governments is advisable to ensure that development applications are correctly routed to the local planning and building department(s) for processing.

5.2.3 Compatible Use Zoning.

5.2.3.1 The establishment of zoning allowing only compatible industrial or commercial uses near airports can be effective in preventing some kinds of incompatible development, but the technique has several potential limitations. Perhaps the most serious limitation is that standard commercial or industrial zoning lacks the flexibility to efficiently address all attributes of land uses that may create airport compatibility problems. The regulations applying in standard industrial and commercial zones limit land uses to those that are compatible with industrial and commercial development. Often, certain kinds of noise-sensitive institutions, such as hospitals or schools, are allowed in such districts. Standard commercial and industrial zoning also can allow design features that may be hazardous to aircraft in flight, such as smoke, vapor, thermal plumes, or bird attractants.

5.2.3.2 Another limitation of compatible use zoning is the need to balance the supply of industrial and commercial-zoned land with demand. If the market for commercial or industrial-zoned land is weak, and if property owners perceive that they are effectively being prevented from developing their land, they can exert political pressure or, in extreme cases, sue in court to force rezoning of the land. This can occur if the total supply of commercial and industrial land vastly exceeds overall demand or if the land, which has been zoned for commercial and industrial use, is not yet ripe for such development or is ill suited for those uses because of site problems, poor access, or inadequate water and sewer service.

5.2.4 Standalone Airport Zoning Ordinances.

5.2.4.1 Many states authorize the establishment of specialized Airport Zoning Ordinances. These statutes are usually separate from those authorizing general-purpose land use planning and zoning. In many cases, the statutes authorize the means through which multiple jurisdictions can coordinate in creating a regional approach to airport land use compatibility regulation. Some statutes, for example, authorize the creation of multi-jurisdiction airport zoning commissions. In some states, however, the scope of authority is limited to airspace protection or the avoidance of creating hazards to flight, rather than granting broader land use regulatory authority.

5.2.4.2 A particular challenge of stand-alone airport zoning ordinances is the need incorporate them into the development permitting processes of local governments. It is essential for one of the participating jurisdictions to take a lead administrative role, and to maintain ongoing coordination with the other jurisdictions and the airport to ensure the effective administration and enforcement of these ordinances.

5.2.5 Transfer of Development Rights.

5.2.5.1 Transfer of Development Rights (TDR) programs are based on the principal that land ownership actually involves the ownership of a bundle of rights to the land. According to this theory, a property owner can sell or transfer some of the rights to the use of his or her property without surrendering the title to the entire property. TDR programs intended to guide the pattern of development in a community are typically adopted through zoning ordinances. The community is divided into sending and receiving zones, and development rights, expressed as maximum permitted densities or floor area ratios (FARs), are allocated to all properties in each zone. Properties in the receiving zones may be developed to higher densities or FARs than allowed under the zoning if the property owner is able to purchase additional development rights from a property owner in a sending zone. The idea is to create economic incentives to limit development in the sending zones and to concentrate development in the receiving zones.

5.2.5.2 TDR programs tend to be most effective in high-growth areas. Airport operators and local governments interested in exploring the use of TDR programs should consult with legal counsel to verify that the technique is allowed under state law.

5.2.6 Subdivision Regulations.

5.2.6.1 Subdivision regulations control the platting of land by establishing site-planning standards, including standards for lot layout, the placement of utilities, and the dedication of public rights-of-way and easements. Some jurisdictions have used subdivision regulations to promote compatible

development in airport environs by requiring the consideration of aircraft noise at the time public officials are reviewing the plat. This might take the form of requiring further noise attenuation features in site design or decreasing or shifting the density of portions of the development. Unless subdivisions are extremely large, however, the altering of lot patterns and shifts in residential density would be of little consequence in reducing noise exposure for residences.

5.2.6.2 Subdivision regulations can also be used to dedicate avigation easements. Legal counsel should be consulted before adopting such provisions as this area of land use law is undergoing change.

5.2.6.3 Some jurisdictions have incorporated fair disclosure requirements into their subdivision regulations to help ensure that people purchasing lots are made aware that the property is within an airport influence area and may be exposed to aircraft noise before they close on the purchase of the property. Fair disclosure provisions may take any of several forms, as discussed in Section 5.6.

5.2.7 Building Codes.

5.2.7.1 Building codes regulate the construction of buildings and set standards for materials and construction techniques to protect the health, safety, and welfare of occupants. Building codes address structural concerns, ventilation, and thermal insulation and apply to new construction and major alterations to existing structures. A good use of building codes for local land use compatibility is to address noise. For example, building codes can require sound insulation for residential and other noise sensitive facilities constructed in areas subject to high levels of aircraft noise.

5.2.7.2 Because of the complexity of building technology, most cities and counties in the United States have long relied on model building codes prepared by specialized standards organizations. Today in the United States, the International Building Code is the model code that is in widespread use.[4] It applies to all nonresidential construction, including multi-family development over three stories. The International Residential Code applies to dwellings and townhouses up to three stories.[5] These standard codes do not include provisions for sound insulation to protect occupants from especially high levels of exterior noise. Thus, local governments that wish

[4] http://www.iccsafe.org.
[5] http://shop.iccsafe.org/codes/2018-international-codes-and-references/2018-international-residential-code-and-references.html.

to provide standards for the attenuation of significant aircraft noise levels should adopt measures to supplement the standard building codes.

5.2.7.3 A particularly effective way to administer building code provisions for sound insulation is in tandem with airport compatibility overlay zoning. The overlay-zoning ordinance would stipulate the types of land uses that require sound insulation within the various noise exposure contours. The building code would include provisions explaining how the sound insulation requirements can be achieved.

5.2.8 Project Review Standards.

5.2.8.1 Planning staffs, planning commissions, zoning boards of appeals, and local governing bodies are often required to use judgment in making recommendations and decisions on community development actions such as site plan approvals, rezoning and subdivision applications, and proposed public improvement projects. Project review standards and guidelines can provide a structured way for decision-makers to consider airport land use compatibility as they review development proposals.

5.2.8.2 Project review standards can be incorporated into zoning ordinances or prepared as administrative guidelines for use by project planners as they analyze development proposals and prepare recommendations for planning commissions, boards of zoning appeals, and governing bodies. Project review standards should include provisions ensuring that airport representatives are informed of the proposed development projects so that they have an opportunity to review and comment on the proposals.

5.2.8.3 Project review standards are recommended to include guidance to ensure that noise compatibility, the safety of people on the ground, flight safety, and airspace protection are considered during review and approval of development proposals.

5.3 Land Acquisition Techniques.[6]

Numerous acquisition techniques are available for airports that are trying to achieve or maintain compatible land use around their facilities. **Table 5-3** provides a summary of these techniques, and a detailed description of each is provided in the following sections.

[6] AIP funding requirements for land acquisition (e.g., eligible airport use, good title, compliance with the federal Uniform Relocation Act, etc.) are described in the FAA AIP Handbook, FAA Order 5100.38.

Table 5-3. Property Acquisition Tools and Techniques

Technique	Description	Key Value	Primary Shortcomings	When to Use
Fee Simple Acquisition	Complete purchase of land and all improvements on the property.	Airport operator gains complete control over property and any future development. Can be an effective means of noise mitigation as well as preventing encroachment.	High cost. Land removed from tax rolls unless converted to compatible land use. Maintenance obligation for airport operator.	Land ownership for planned aeronautical development land, RPZs and redevelopment of land subject to significant noise levels under noise compatibility program measures.
Purchase Options, Land Contracts, Life Estates	Method to position the airport operator for future acquisition of the property.	Provide flexibility to airport operators and sellers, while assuring airport operator of ultimate ability to acquire the property and minimizing near-term costs.	Initial costs may be small, but full acquisition costs must inevitably be paid. Land ultimately removed from tax rolls unless converted to compatible land use. Maintenance obligation for airport operator.	To secure ownership of RPZs, areas subject to high noise levels, and areas beneath runway approaches. Use when acquisition is not urgent or when limited funding is available in the near-term.

Technique	Description	Key Value	Primary Shortcomings	When to Use
Avigation Easements	A conveyance of airspace over another property for use by the airport. Easement rights acquired typically include the right-of-flight of aircraft; the right to cause noise, dust, etc.; the right to remove all objects protruding into the airspace together with the right to prohibit future obstructions or interference in the airspace; and the right of ingress/egress on the land to exercise the rights acquired.	May be less expensive than fee simple acquisition; land remains on the tax rolls. May provide more positive control than zoning. May be conveyed "outright" or in exchange for sound insulation under an airport noise compatibility program.	Outright easement acquisition as sole noise compatibility measure (i.e. without sound insulation) does not alter existing property noise exposure on a property.	Use when needed to gain right to remove obstructions (i.e. trim trees), prevent future obstructions on the property, prevent incompatible use or development of RPZ. An easement conveyance for an airport noise compatibility program (NCP) acknowledges the property has been mitigated under the NCP.
Purchase of Development Rights	The rights to develop the property for incompatible uses are purchased by the airport operator and held in perpetuity.	Prevents development of incompatible uses. Potentially less costly than fee simple acquisition. Keeps land on the tax rolls. Compensates property owner for keeping land undeveloped.	Difficult to establish fair market value. In areas experiencing development pressure, development rights may cost nearly as much as the entire property.	In rural areas where compatible use zoning or noise overlay zoning is not feasible. Prevent development within current or planned RPZ and approaches.

Technique	Description	Key Value	Primary Shortcomings	When to Use
Purchase of Conservation Easements	Easements that preserve land in an undeveloped state.	Prevents development of incompatible uses. Potentially less costly than fee simple acquisition. Keeps land on the tax rolls. Compensates property owner for keeping land undeveloped.	Difficult to establish fair market value.	In wetlands, forest areas, prime farmland, and other areas with important environmental or scenic attributes.
Sale or Lease of Airport Land Subject to Compatible Use Conditions	Release of airport-owned land that is not needed for airport purposes.	Returns land to the tax rolls. Revenue earned by the airport can be used for airport development or noise mitigation purposes. Long-term land use compatibility is assured.	Requires thorough long-term planning to ensure that the land will not be needed for a future airport purpose.	When airport has very large tracts of land that will clearly not be needed for airport development.

5.3.1 Fee Simple Acquisition.

Fee simple acquisition involves the purchase of an entire property, including structures and facilities, as well as the air and mineral rights. This is often the most effective mitigation strategy to protect an airport because the airport assumes sole ownership of the property, allowing the airport sponsor to maintain the property in a compatible manner. Airport sponsors should own, if possible, land within the Object Free Areas (OFAs) and Runway Protection Zones (RPZs) while taking into account the costs and physical limitations associated with individual parcels. Where development already exists in RPZs, other methods of control, such as easements and/or deferred possession via land contracts or purchase of development rights, may be more effective long-term solutions for clearance. To the extent practicable, land acquisition should include adequate areas surrounding the runways to protect approach and departure surfaces for both existing and planned runways and runway extensions.

5.3.2 Purchase Options, Land Contracts, Life Estates.

5.3.2.1 If property acquisition is not immediately feasible or necessary, deferred acquisition techniques may be effective. One of these techniques is known as a "purchase option" where the airport sponsor pays a property owner an agreed upon sum of money to secure the right to purchase the property during a specified period of time. The FAA issued a guidance document in 1997 entitled, *Report to Congress on Potential for Use of Land Options In*

Federally Funded Airport Projects.[7] This document details the requirements and limitations of land option contracts for airport development projects.

5.3.2.2 Another deferred purchase technique is known as a "land contract," where the airport sponsor pays a property owner a specified amount in multiple installments (monthly, bi-annual, etc.), which go toward the purchase of the property when it is no longer being used and occupied by the selling property owner. These contracts have an agreed upon term, after which the airport operator takes possession of the property

5.3.2.3 A third technique is the purchase of a life estate. The property owner retains the right of occupancy until death, or until he or she no longer desires to occupy the property as their permanent residence.

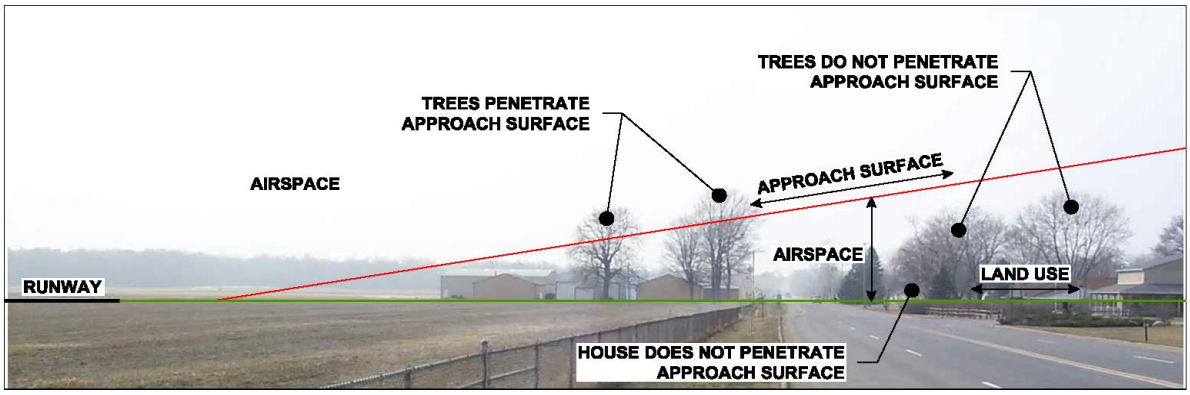
5.3.3 Purchase of Avigation Easements.

5.3.3.1 An easement is a right or privilege that one party has to the limited use of the property of another party. Avigation easements are often purchased by airport sponsors to protect the surrounding airspace from encroachments and land from incompatible development (such as incompatible development in RPZs or future RPZs). Avigation easements, which are attached to the deed and run with the land, can also include notices that the property is subject to aircraft noise and other airport-related effects. They can also include non-suit covenants protecting the airport operator from lawsuits related to lawful use of the property as stipulated in the easement document.

5.3.3.2 Avigation easements are effective in helping airport operators protect critical airspace by enabling access to ensure that vegetation remains clear of the airspace. **Figure 5-1** illustrates a penetration of trees to an approach surface, which an airport may remedy with an avigation easement and removal of the trees. The easement would include the right to remove the penetrating tree, as well as the perpetual right to remove trees that may become penetrations in the future. Such an easement would also typically limit the construction of any new structure that would penetrate this surface or creation of any land use that would be detrimental to aircraft operations within the described easement area.

[7] U.S. Department of Transportation, Federal Aviation Administration, *Report to Congress on Potential for Use of Land Options in Federally Funded Airport Projects*. Report of the Secretary of Transportation to the United States Congress, Washington, D.C., December 1997.

Figure 5-1. Tree Obstruction in a Runway Approach



5.3.3.3 Avigation easements often provide more positive control than zoning and are applicable when fee simple purchase is unnecessary (e.g., where surface use below overflight elevation is compatible). In addition, because the land can remain in private ownership, it remains on the tax rolls. It is important for airport operators to maintain a record of their avigation easements and actively manage the properties in order to be effective. Avigation easements providing for overflight to/from the airport run with the title of the land encumbered, and bind succeeding owners to the height and land use controls described in the easement. Easements protect the described airspace and compatible land use controls needed for current and planned development and operations at the airport. If subsequent future airspace needs exceed the land use or development controls of an existing easement, modified easement rights may need to be acquired by the airport to protect for expanded airspace controls over an easement-encumbered property.

5.3.4 Purchase of Development Rights.

5.3.4.1 As previously noted in the discussion of Transfer of Development Rights programs, land ownership involves a bundle of rights, including the right to develop the property to the extent allowed by law. The right to develop property has a value and it can be separated and sold apart from the entire fee. The purchase of development rights has most often been used to promote the preservation of environmentally sensitive areas and agricultural properties. The entity that purchases the development rights holds them in perpetuity, thereby restricting development on the subject property.

5.3.4.2 Airport operators can purchase development rights to promote airport land use compatibility (such as incompatible development in RPZs or future RPZs). In rural areas, this can be a cost-effective way to guarantee long-term land use compatibility while keeping the property on the tax rolls. In suburban and developing areas, the technique can be less effective as the value of the development rights can approach the value of the full fee simple land value.

5.3.5 Purchase of Conservation Easements.

5.3.5.1 Conservation easements have historically been purchased by nonprofit environmental organizations, and state natural resources and environmental protection agencies, to protect sensitive lands from development. The property owner maintains ownership of the land but surrenders the right to develop the property, as described in the easement document. Conservation easements can be adapted to promote airport land use compatibility by limiting the right to develop the property for any incompatible land uses.

5.3.5.2 Conservation easements are generally best used on agricultural, forest, wetland, scenic, or open space land to limit or prevent the development of incompatible land uses on or near airport environs.

5.4 Noise Mitigation.

Airport operators and local governments can use techniques to mitigate the adverse effects of noise on existing noise-sensitive land uses. A 14 CFR Part 150 Noise Compatibility Program (NCP) (see section 5.4.1 below) is a voluntary planning activity to assess the need for noise mitigation measures. An airport NCP may include aircraft noise abatement measures, such as preferential runway use programs, the use of noise-compatible flight routes, noise abatement departure procedures, and airfield modifications.[8] It may also include mitigation measures such as the acquisition of noise-sensitive property, the purchase of noise and avigation easements, sound insulation, and the construction of sound barriers. Sound insulation and airport sound barriers, summarized in **Table 5-4**, are discussed in the following sections.[9] Property acquisition and easements is discussed in above in Section 5.3.

Table 5-4. Noise Mitigation Tools and Techniques

Technique	Description	Key Value	Primary Shortcoming	When to Use
Noise Compatibility Program (NCP)	Comprehensive analysis and selection of noise mitigation and abatement	Provides extensive stakeholder participation in thorough	To be successful, requires considerable time and	When airport management concludes federal assistance is necessary to establish adequate noise

[8] Use restrictions cannot be mandatory upon users unless they are first approved by the FAA through 14 CFR Part 161, Notice and Approval of Airport Noise and Access Restrictions.

[9] Aircraft noise abatement procedures are beyond the scope of this AC. Refer to 14 CFR Part 150, FAA AC 150/5020-1, *Noise Control and Compatibility Planning for Airports*, FAA AC 150/5020-2, *Guidance on the Balanced Approach to Noise Management*, and FAA Order 8400.9, *National Safety and Operational Criteria for Runway Use Programs* for information on this topic.

Technique	Description	Key Value	Primary Shortcoming	When to Use
	measures including: Land acquisition Sound barriers Preferential runway Flight procedures Voluntary use restrictions based on noise Sound insulation of homes and schools	identification of means to improve and maintain land use compatibility; study supported by federal funds; can provide eligibility for federal funding of some measures; can establish productive working relationships among stakeholders.	involvement by airport staff, public, and airport users; may raise public expectations unless carefully managed.	mitigation/abatement measures for the airport.
Sound Barriers	Noise walls, earthen berms, dense stands of trees, ground runup enclosures that attenuate noise from aircraft ground operations	Reduces noise exposure in sensitive areas very near the airport that are exposed to airport ground noise.	Tend to be most effective over relatively short distances. Have no effect on overflight noise.	Use for noise-sensitive areas along the runway sidelines or where aircraft maintenance run-ups are common.
Sound Insulation	Measures used to attenuate outdoor noise in noise-sensitive buildings, such as housing, schools, nursing homes, places of worship, etc.	Can substantially reduce the levels of outdoor noise reaching the interior of buildings.	Reduces only the indoor noise levels. Effectiveness requires windows to be closed, necessitating air conditioning or closed-window fresh air circulation systems. Costs of construction materials.	Can be required through overlay zoning and building codes where the development of noise-sensitive land uses is allowed within relatively high-noise areas. Can be used as a noise mitigation measure for existing noise-sensitive land uses (homes, schools, etc.) exposed to noise above 65db DNL and eligible for sound insulation under a FAA-approved Noise Compatibility Program.

5.4.1 Noise Compatibility Program (NCP).

NCPs are intended to bring together various stakeholders to develop techniques to establish and maintain aircraft noise-compatible uses around an airport, and to address noise impacts on existing incompatible uses.

5.4.1.1 Participation is voluntary, but airports must complete a Part 150 Study (see Section 4.2.2 on 14 CFR Part 150 planning studies) in order to obtain FAA funding for most noise-mitigation measures - such as sound attenuation of existing residences or installation of noise monitors.[10] Eligibility for funding is only possible when Noise Exposure Maps (NEMS) are in compliance with the regulatory requirements and measures within the NCP, and are approved by the FAA. For description of NEM's as a notification tool under federal law, see Section 5.6.3.

5.4.1.2 NCPs evaluate and implement various noise abatement and mitigation measures, such as sound barriers and sound insulation. They may also include modified procedures for aircraft, such as designating areas for ground run-up usage. Certain noise-abatement measures do not require a Part 150 study, such as sound attenuation for schools. Airports also have the ability to use revenues from Passenger Facility Charges for noise mitigation actions even without the approval of a Part 150 NCP.[11]

5.4.1.3 Like a master plan process, Part 150 studies include a comprehensive public involvement strategy and encourage communication between various stakeholders. This provides a framework for productive working relationships among stakeholders that contribute to improved compatible land use decisions. FAA guidance to airport sponsors for Part 150 program development is provided in FAA AC 150/5020-1, *Airport Noise Control and Compatibility Planning.*

5.4.2 Sound Barriers.

Many airport operators have built sound barriers to lessen the effects of noise in noise-sensitive areas near airports. Sound barriers have limited applications and are typically used on airport property to shield nearby noise-sensitive areas from noise produced by aircraft on the ground. Earthen berms, walls or dense plantings of vegetation can be used to shield noise sensitive areas. Maintenance costs, in addition to initial construction costs, should be considered as part of the material selection process. Construction of Ground Run-up Enclosures (GREs), structures that house aircraft during engine run-ups for maintenance checks, may also be effective.

[10] FAA funding may be available for noise mitigation measures approved in an environmental record of decision for an airport development project. See FAA Order 5100.38, *Airport Improvement Program Handbook.*
[11] FAA Order 5500.1, *Passenger Facility Charges*, Subsection 4-6.

5.4.3 Sound Insulation.

Sound insulation is a noise mitigation measure that can be incorporated into many existing buildings to reduce the interior noise levels (new construction must conform to modern construction codes and techniques that provide sound insulation standards and requirements). Sound insulation is aimed at reducing aircraft noise within homes and other noise-sensitive structures. It is usually accomplished through the baffling of vents and the installation of acoustical windows, doors, additional insulation, and other materials that attenuate the transmission of noise into the structure. There are several guidance documents and handbooks that aid in the development and management of sound insulation programs, and to provide advice on sound attenuation materials and building techniques.[12] Naturally, sound insulation is only effective in attenuating noise inside structures. The outdoor noise environment remains unaffected. Sound insulation programs may be administered by airport operators or local governments.

5.5 Wildlife and Habitat Management.

Information included in this section is taken from *Wildlife Hazard Management at Airports: A Manual for Airport Personnel*, published through joint efforts by the FAA and the Department of Agriculture. Wildlife and habitat management tools, summarized in **Table 5-5**, are intended for use by airport operators to reduce potential hazards to aircraft operations caused by wildlife. Part 139 certificated airport operators are specifically required by federal regulations to take actions to alleviate wildlife hazards at their airports.[13] The following sections describe tools that airport operators can use to meet that obligation.

[12] See, for example, *Guidelines for Ensuring Longevity in Airport Sound Insulation Programs*, ACRP Report 105, Transportation Research Board, Washington, D.C., 2014;, *Guidelines for Airport Sound Insulation Programs*, ACRP Report 89, Transportation Research Board, Washington, D.C., 2013; Metropolitan Council, *Builders Guide: Mitigating Aircraft Noise in New Residential Construction*, St. Paul, MN, 2006; Wyle Research & Consulting, *Guidelines for Sound Insulation of Residences Exposed to Aircraft Operations*, prepared for the Department of the Navy, Naval Facilities Engineering Command, Washington, D.C., 2005.

[13] See 14 CFR 139.337, Wildlife Hazard Management.

Table 5-5. Wildlife and Habitat Management Tools and Techniques

Technique	Description	Key Value	Primary Shortcomings	When to Use
Wildlife Hazard Management Plans	The Wildlife Hazard Management Plan is developed to implement needed controls at and in the vicinity of the airport. A Wildlife Hazard Assessment identifies wildlife hazards in the airport vicinity and describes the measures to reduce and manage potential hazards.	Wildlife Hazard Assessment inventories and identifies existing wildlife activity and habitats to determine potential wildlife hazards.	Continuous monitoring and control measures must be used to reduce or eliminate wildlife attractants. In sensitive environmental areas, state and federal environmental officials will need to be involved to help in balancing needs for environmental protection and airport safety.	Should be used in accordance with federal regulations and FAA guidance where wildlife hazards exist.
Natural Features Inventory and Mitigation	Specific planning tool, which assesses vegetation and habitat in the airport vicinity.	Identifies habitat that may host wildlife potentially hazardous to aircraft movements and provides the information required to manage the potential hazards.	Problematic vegetation and habitat may be outside the airport, creating a challenge to remove, trim, mark, or manage.	Use where problematic vegetation and habitat are suspected. May require the purchase of land or easements to secure the right to mitigate potential hazards.

5.5.1 Wildlife Hazard Management Plans (WHMP).

The purpose of a Wildlife Hazard Management Plan (WHMP) is to minimize the risk to aviation safety, airport structures and equipment, and human health posed by populations of hazardous wildlife on and around an airport. Specific guidance about the content of a WHMP is provided in FAA Advisory Circular 150/5200-33[14] and in the *Wildlife Hazard*

[14] FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*, August 8, 2007. See the FAA website for the current version.

Management at Airports manual.[15] A WHMP must identify and provide information on hazardous wildlife attractants on or near an airport (including an evaluation of land uses around an airport), and identify appropriate wildlife management techniques to minimize and mitigate those wildlife hazards (including land use changes). ACRP Report 32 provides guidance on identifying hazardous wildlife and establishing wildlife hazard control programs at GA airports.

5.5.2 Natural Features Inventory and Mitigation.

5.5.2.1 In order to protect navigable airspace and the safe movement of aircraft, airports should consider completing an inventory of existing vegetation within runway approaches and Runway Protection Zones (RPZs). A Natural Features Inventory identifies vegetation and habitat that supports wildlife by providing food and cover. From this inventory, mitigation measures can be developed that can reduce the likelihood of wildlife strikes or hazards on or near an airport by reducing, eliminating, or excluding natural features that support wildlife.

5.5.2.2 When evaluating vegetation concerns near airports, best practices should be utilized to minimize potential wildlife attractants. Most agricultural crops, especially cereal grains and sunflower, can attract wildlife during some phase of production. Trees and other landscaping plants that produce fruits or seeds are especially attractive to birds. Large expanses of grass and forbs can sometimes provide ideal habitats for rodent and insect populations that attract both avian and mammalian predators. Furthermore, grasses allowed to produce seed heads can provide a desirable food source for many flocking species. In addition to food, wildlife requires cover for resting, roosting, escape, and reproduction, and this cover can often be found among tall grasses and trees. By minimizing or eliminating food sources and vegetative cover, some wildlife hazards can be mitigated.

5.6 Notification Tools and Techniques.

5.6.1 Notification techniques are intended to provide information to prospective buyers of property near airports about the potential effects caused by airport and aircraft operations. The intent is to allow people to make fully informed decisions about the purchase of property in the airport vicinity. Presumably, people who are highly sensitive to noise or other airport-related effects would choose to avoid purchasing property exposed to those effects.

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[15] Cleary, Edward C. and Richard A. Dolbeer, *Wildlife Hazard Management at Airports, A Manual for Airport Personnel*, 2nd Edition, U.S. Department of Transportation, Federal Aviation Administration and U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 2005.

5.6.2 These techniques are best used in combination with land use compatibility regulations, such as residential sound insulation programs, or in areas more distant from the airport that are exposed to relatively low noise levels and higher altitude overflights. **Table 5-6** summarizes these notification techniques.

Table 5-6. Notification Tools and Techniques

Technique	Description	Key Value	Primary Shortcoming	When to Use
Noise Exposure Map	Federal statute, 49 U.S.C. §47506, provides that publication of FAA approved NEM may be constructive notice of airport noise exposure to prospective purchasers of property.	Provides public notice and limits liability of airport owners for home purchases subject to mapped noise levels.	Some communities misunderstand the NEMs and do not recognize that noise contours can change over time due to changes in airline industry activity levels and aircraft performance characteristics. Updates will be required.	Effective tool to disclose noise conditions within the airport environs. Serves as basis for airport voluntary noise measures. Compliant NEMs are basic component of airport voluntary noise compatibility planning programs.
State-mandated Fair Disclosure	State laws requiring the disclosure of information about the proximity of airports, airport noise levels, or zoning of properties offered for sale.	Provides the opportunity for prospective buyers to learn about potential airport-related effects on the property before deciding to purchase.	Not all prospective buyers fully understand the information that is provided. Airport has no defined role in this process.	This technique must be used by sellers and their agents as mandated by state law.
Covenants and Deed Restrictions	Legal document attached to the property title that may disclose the proximity of the property to the airport, potential airport-related effects on the property, and obligate owners to disclose this information to prospective buyers.	As a permanent part of the property record, it provides a means of disclosing potential airport-related effects to prospective buyers of property.	Often, covenants and deed restrictions are not made known to buyers until the time of closing on the property sale, which is often too late for a buyer to act on the information. Must be actively enforced by the airport for compliance.	Best used when state disclosure laws are weak. Covenants and deed restrictions could be required as conditions of approval of sensitive land uses within the airport influence area.

Technique	Description	Key Value	Primary Shortcoming	When to Use
Nonsuit Covenants and Hold Harmless Agreements	Legal contract between the property owner and the airport sponsor where property owner acknowledges the potential for airport-related effects on the property and agrees not to sue the airport for lawful airport operations and activity.	Typically used with an avigation or noise easement, airport owner is relieved of liability for lawful airport-related effects on the property.	Often, covenants and deed restrictions are not made known to buyers until the time of closing on the property sale, which is often too late for a buyer to act on the information. Does not prevent political action to oppose airport expansion or advocate operational restrictions.	Best used when state disclosure laws are weak. Covenants hold harmless agreements, and easements could be required as conditions of approval of sensitive land uses within the airport influence area.
Disclosure Notices	Actions required of developers to inform prospective buyers of potential airport-related effects on the property.	Informs prospective buyers of potential airport-related effects on the property.	Does not alter existing or future land issues, is an informative tool only. Effective only for the first round of buyers in a new development.	Best used when state disclosure laws are weak. Would apply to new subdivisions or planned unit developments in the airport influence area.

5.6.3 Noise Exposure Map (NEM).

As stated earlier, an NEM is another tool that depicts the land uses and levels of noise exposure around the airport, both for existing conditions and for forecast operations. NEMs are typically prepared as the first stage in a Part 150 Noise Compatibility Program and are submitted to the FAA. The Vision 100-Century of Aviation Reauthorization Act (Public Law 108-176) required FAA to make noise exposure and land use information from NEMs available to the public via the internet on its website, and has done so by providing links to airport web sites and NEMs or similar documents that are posted there. Under 49 U.S.C. §47506, *Limitations on recovering damages for noise*, an airport may submit an NEM to the FAA and publish a conforming public notice of the NEM. A person purchasing property is considered to have constructive knowledge of the noise exposure on a property with the prior publication of the airport's NEM, or is a given a copy of the NEM prior to purchase. Under the statute owners of property acquired after February 18, 1980 cannot recover damages for noise attributable to the airport unless the owner can show that after acquiring the property there was a significant change in the type or frequency of aircraft operations, airport layout, flight patterns or an increase in nighttime operations, and the damage result from the change or increase.

5.6.4 State-Mandated Fair Disclosure.

5.6.4.1 All states regulate the transfer of real estate through legislation and administrative regulations. Many states require that sellers of property and their agents disclose specific information about property when it is offered for sale, including, in some states, proximity to any nearby airports. Many states require the disclosure of land use regulations and zoning applying to property offered for sale.

5.6.4.2 Airport operators and local governments interested in promoting an awareness of potential airport-related effects among buyers of property should consult with legal counsel to ascertain the potential for state law to help in fulfilling this objective. In states requiring the full disclosure of zoning information, for example, the creation of an airport compatibility overlay-zoning district may be an effective way to promote the disclosure of potential airport-related effects among prospective buyers of property within the overlay boundary.

5.6.5 Covenants and Deed Restrictions.

5.6.5.1 Covenants or deed restrictions are recorded legal documents that are linked to the title of a property in perpetuity.[16] They are most commonly used by developers in establishing design standards or other performance standards to assure the maintenance of certain standards of quality in a new subdivision or other development project.

5.6.5.2 In some areas, covenants and deed restrictions have been used to promote the disclosure of potential airport-related effects in airport-vicinity development projects. The language of the deed restriction can include any of a variety of terms, including:

- Describing the nature of the airport-related effects to which the property is exposed.
- Noting the proximity of the airport and advising property owners to consult the airport operator for specific information about airport-related effects.
- Obligating the owner to disclose the deed restriction to prospective buyers whenever the property is offered for sale.
- Waiving the right of the property owner to sue the airport operator for lawful use of the airport and the airport-vicinity airspace.

[16] In some states, covenants expire after a given period unless they are renewed through specific action by the parties subject to the covenants.

5.6.5.3 Depending on the specific provisions of state law, local governments can also require the recordation of covenants and deed restrictions as a condition of zoning or subdivision plat approval. An airport operator can also purchase covenants or deed restrictions much like an avigation easement. Because they become a permanent part of the property record, covenants and deed restrictions can help to ensure that future buyers of property are made aware of the potential for airport-related effects on the property.

5.6.6 Nonsuit Covenants and Hold Harmless Agreements.

Nonsuit covenants and hold harmless agreements are legal contracts between a property owner and an airport sponsor that acknowledge the potential airport-related effects on incompatible land uses. A nonsuit covenant or hold harmless agreement is typically used together with an avigation or a noise easement, and is recorded and attached to the property title. These agreements legally record that a property owner acknowledges the potential for noise and other airport-related effects, and has agreed not to sue or hold the airport for any such effects. Because nonsuit covenants and hold harmless agreements become part of the property record, they can help to ensure that future buyers of property are made aware of the potential for airport-related effects on the property.

5.6.7 Disclosure Notices.

A disclosure notice is a way to make buyers aware of any land use compatibility issues that may arise on a piece of property near an airport, as well as the various easements, agreements, and rights that may already be in place on the property. Through the development permitting process, local governments can require developers to take certain actions to promote the disclosure of information about potential airport-related effects on new development projects. Examples include:

- The inclusion of statements on final subdivision plats disclosing the potential for airport-related effects, or even plotting noise contours on the plats.
- Requiring sales offices on the grounds of the development project to provide information about the location of the airport and any airport-related effects on the property.
- Posting of signs on the property, during the development and initial sales process, giving notice of the potential for aircraft overflights or other airport-related effects.

5.7 Education and Communication.

5.7.1 Successful public education and outreach programs are important in developing awareness in the community about the importance of airport land use compatibility. Over time, this can help build a constituency to support airport land use compatibility. When airport operators take the lead in providing information and participating in two-way communication with the public and other community leaders, enhancement of the airport operators' credibility can be a valuable result. This greatly improves the ability

of the airport operator to advocate persuasively for airport land use compatibility planning and can aid the success of those planning efforts.

5.7.2 The FAA's Community Involvement Manual describes practices and effective techniques to facilitate meaningful community involvement, including effectively engaging communities, encouraging exchange of information, and having community viewpoints heard. Refer to AC 150/5050-4, *Citizen Participation in Airport Planning*[17] and ACRP Report 15, *Aircraft Noise: A Toolkit for Managing Community Expectations*, for more detailed information. **Table 5-7** summarizes these education and communication techniques.

Table 5-7. Education and Communication Tools and Techniques for Airport Operators

Technique	Description	Key Value	Primary Shortcoming	When to Use
Community Outreach	Communication with the public to inform them about the airport and to solicit their views and ideas. This can include public workshops, community meetings, and informational newsletters.	Aids in community understanding of airport needs and constraints. May help to build local support for airport.	Sometimes can be used as a forum for anti-airport groups. Can be unsuccessful if there is a lack of public participation.	In airport planning processes and whenever an airport needs to build community awareness and support.
State DOT/Aeronautics/Aviation Departments	Participation, outreach to users, state legislature, local governments, FAA coordination.	Statewide efforts	Subject to state budget volatility.	Developing statewide capital improvement program, legislative agenda.

[17] Being updated and expanded simultaneously with the preparation of this draft update AC.

Technique	Description	Key Value	Primary Shortcoming	When to Use
Local Government Involvement	Encouraging participation by local government in airport planning and development efforts. This can be achieved through participation on advisory committees or during public involvement, meetings, etc.	Builds local governmental support and coordinated efforts for future community and airport development. Encourages open lines of communicatio n.	Coordinating and collaborating with multiple agencies with differing interests can be challenging.	Before, during, and after any major airport or community planning initiative or development project.
Outreach to Airport Users	Airport user actions can benefit the local community and encourage community appreciation.	Can build respect between airport users and local and community members.	Many of these programs are voluntary and may not be followed by all users.	Ongoing programs such as “Fly Quiet” are beneficial when a community is adversely impacted by noise during particular times of the day/night.
Airport, State DOT/Aeronautics and FAA Participation in Local and Regional Planning	Airport sponsors and FAA staff coordinating and participating with local governmental entities in community planning efforts. This can include attending public meetings.	Builds local governmental support and coordinated efforts for future community and airport development. Encourages open lines of communicatio n.	Coordinating and collaborating with multiple agencies with differing interests can be challenging.	Before, during, and after any major airport or community planning initiative or development project.

Technique	Description	Key Value	Primary Shortcoming	When to Use
Airport and FAA Participation in Professional Planning Organizations	Participation of airport sponsors and FAA staff in professional planning organizations to advocate for coordinated planning efforts between airports and local communities.	Raises awareness of a larger audience to the importance of coordinated land use planning efforts.	Presentations, training sessions, and article writing require a greater amount of preparation in advance.	When a specific industry group is targeted for collaboration.
Coordination with Real Estate Developers and Brokers	Educate real estate professionals and developers to advocate for compatibility.	Protects the interests of potential clients, and raises awareness of incompatibility prior to a purchase.	Not all real estate professionals or developers will fully understand the consequences of incompatibility. Some may minimize their significance for the purpose of completing the transaction.	Particularly helpful in communities that are experiencing a large amount of new development. To be successful, these education efforts must be conducted as early in the process as possible – before projects are developed or transactions are finalized.
Use of Social Media	Use of social media outlets such as Facebook, Twitter, and webpages.	Instant information push.	Only benefits those who are familiar with and use social media.	When instant communicatio n is needed or for easy information sharing at any time to a large audience.

Technique	Description	Key Value	Primary Shortcoming	When to Use
Use of Focus Groups	A group of people that generate feedback and gauge response to airport planning and development initiatives.	Generates information at a formative stage so adjustments can be made. Provides opportunity for engagement and information dissemination.	Most useful for larger projects with room for change; limited benefits for smaller-scale projects with pre-determined outcomes.	During the course of major planning of development initiative or on-going to maintain a flow of information and engagement.
Education of State Legislators and Legislative Staff	Outreach to elected and administrative officials that are in a position to make decisions regarding land use compatibility.	Establishing open lines of communication with individuals who can impact funding and legislation related to land use compatibility.	Reaching these individuals and helping them understand the importance and impact of compatibility issues can be challenging.	When the support of officials is critical to the success of compatibility efforts. This could include prior to proposing state-wide legislation to allow for local airport sponsors to enact airport overlay zoning in their local community.

5.7.3 Community Outreach.

5.7.3.1 Many airport operators have established ongoing programs of public communication and outreach. The programs include distributing informational newsletters, providing informational programs and airport tours to local schools and interested citizens, and establishing dedicated noise complaint reporting systems. In addition to fostering communication, these programs help to demonstrate the airport operator's commitment as a fully participating member of the greater community.

5.7.3.2 During airport planning processes, including the preparation of master plans and 14 CFR Part 150 NCPs, public workshops and community meetings can encourage open dialogue among stakeholders, and to gain a better understanding of community interests and concerns. This gives the public an opportunity to be informed, become involved, and have their concerns

and views considered in decisions about the future of the airport and land use planning. Airport-area residents and community leaders can also be invited to serve on project advisory committees. These are ideal opportunities to inform the community about the connection between airport land use compatibility planning and community planning efforts. They also provide platforms for public education regarding the economic value of airports and the airport impact on the regional economy. Educational materials such as flyers and newsletters can be developed to support the discussion.

5.7.3.3 ACRP Report 15, *Aircraft Noise: A Toolkit on Managing Community Expectations*, provides information related to the public communication on the issue of airport noise issues.[18] It is a helpful resource for local communities for all types of community outreach.

5.7.4 Local Government Involvement.

Local governments are directly affected by many aspects of airport development and should be invited by airport operators to participate in airport planning processes. In addition to implications for land use compatibility, airport development plans can also affect road and transit systems and public utilities. City and county planners are appropriate participants in most airport planning projects. In addition, airport operators should maintain ongoing communications with city managers, county administrators, and local elected officials. Depending on the scope of the particular planning effort, the airport operator should also reach out to public works directors and city or county engineers.

5.7.5 Outreach to Airport Users.

5.7.5.1 Airport users and pilot organizations have an important stake in promoting airport land use compatibility. They can offer helpful technical advice and insights to the public, local government officials, and elected officials in the deliberations leading to the establishment of land use compatibility plans and programs. Businesses based at the airport or dependent on the airport for the transportation of personnel or the shipment of goods can also convincingly explain the economic importance of the airport to community leaders and elected officials.

5.7.5.2 Airport operators are in a good position to solicit the involvement of airport users in airport land use compatibility planning processes. Airport operators can coordinate with aviation trade organizations, such as the National Business Aviation Association (NBAA) and the Aircraft Owners

[18] *Aircraft Noise: A Toolkit on Managing Community Expectations*, ACRP Report 15, Transportation Research Board, Washington, D.C., 2009.

and Pilots Association (AOPA), in holding programs to inform airport user groups about land use compatibility needs and programs at the local airport.

5.7.5.3 Airport users are encouraged to follow voluntary noise abatement procedures that have been established at an airport. Consistent adherence to noise abatement policies is important to maintaining and strengthening the airport's partnership with local governments and residents, a critical factor in sustaining the goodwill required the local government to continue cooperating with the airport in land use compatibility planning. Airport operators should maintain communication with local pilots and aircraft operators to ensure that they understand local noise abatement procedures and the reasons for those procedures. By providing clear and consistent information to pilots, airport operators can enhance compliance with noise abatement procedures. Actions taken by airport operators include the publication of pilot guides, the publication of noise abatement procedures in the *Airport/Facility Directory*, the posting of informational brochures in pilot lounges, periodic meetings with leaseholders, the placement of signs on the airfield, and the issuance of NOTAMS.

5.7.6 Airport and FAA Participation in Local and Regional Planning.

5.7.6.1 The authority to develop, implement, and enforce land use programs and decisions rests predominantly with local governments. It is imperative that airport operators must be involved in the preparation of city, county, and regional comprehensive plans so that they can advocate for airport interests and provide their specialized expertise to the planning team. The FAA can also be a helpful partner in comprehensive planning to the extent that airport and aviation interests are affected. By providing authoritative information about the scope and limitation of the federal role in land use compatibility and airspace protection, the FAA can provide information needed to encourage local governments to exercise the degree of planning and regulatory control needed to protect the airport.

5.7.6.2 Airport operators should coordinate with local governments to ensure that they are routinely provided information about proposed development activity in the airport environs. This allows airport operators the opportunity to review and comment on those proposals. In areas subject to considerable development pressure, formalized staff committees of local government planners and airport staff can be formed to meet regularly to review and discuss development trends and specific projects. In addition to building important relationships among the participants, this coordination can improve the likelihood that airport compatibility considerations can be addressed early in the development process. It also gives the airport operator the opportunity to keep local government officials informed of airport improvement and development projects in a timely manner.

5.7.6.3 An airport's area of influence, including airspace, noise impact area, and areas of safety concern, can cross multiple jurisdictions, so it is important that the airport operator engage with all affected jurisdictions.

5.7.7 Airport and FAA Participation in Professional Planning Organizations.

Airport operators and FAA representatives can take the message of airport land use compatibility to the planning community through participation in professional planning organizations at the local, state, and national level, such as regional planning organizations, state planning organizations, and the American Planning Association (APA). This participation offers airport advocates the opportunity to network and extend the conversation through direct dialogue with non-aviation planning professionals, contribution of articles to publications, and presentations and training sessions at professional planning conferences. These networking and outreach activities can raise awareness of land use compatibility, open lines of communication, and provide a path for education and training.

5.7.8 Coordination with Real Estate Developers and Brokers.

5.7.8.1 Airport sponsors should reach out to the real estate community to ensure that sales agents and brokers understand the nature of airport-related effects in the community and understand how to get specific information about the airport in response to client questions and concerns. Airport sponsors should encourage real estate professionals to be forthcoming in explaining the nature of airport-related impacts to prospective buyers.

5.7.8.2 Depending on the scope of state real estate disclosure laws, airport sponsors may find some resistance among real estate professionals to the aggressive disclosure of potential airport-related impacts. Airport sponsors need to recognize that real estate professionals are often in the position of balancing the interests of property sellers and buyers. Nevertheless, by consistently providing accurate information about the airport and airport-related effects, airport operators can become trusted advisors and resources to the real estate industry.

5.7.9 Use of Social Media.

As social media comes into the communication mainstream, airports have a new set of tools for sharing information and generating dialogue on land use compatibility. An airport's website is often the central location for organizing and posting information. The website hosts information that can be viewed only when people visit the page. Popular social media tools push information out to subscribers and allow interactive communication. Other social media tools are available for specific purposes including posting video content, sharing photographs, and holding community conversations. Multiple social media tools can be used effectively in a coordinated fashion described in a social media plan and carried out by a social media coordinator. Airports also have the opportunity to monitor social media for valuable information about community concerns.

5.7.10 Use of Focus Groups.

5.7.10.1 Focus groups are used in marketing to generate feedback on new products and to gauge response to new marketing initiatives. Attendees receive an invitation to participate, and the activity is usually conducted as an interview, or a conversation led by a facilitator, and may include the use of keypad polling or other electronic tools. Focus groups can generate valuable information at a formative stage in product development when there is still an opportunity to make adjustments.

5.7.10.2 Focus groups can be used during formal airport planning processes, such as master planning or noise compatibility planning, to gain a deeper understanding of the nature of public concerns and interests than can be achieved through conventional public meetings and comment forums. They can also be effective ways to engage community leaders and local government officials in a planning process on an on-going periodic basis to maintain a communication link.

5.7.11 Education of State Legislators, Legislative Staff, and Administrative Officials.

5.7.11.1 State law establishes the framework within which airport land use compatibility plans and regulations are prepared and implemented. State legislatures are also responsible for funding any programs of airport planning assistance that may have been established. Airport sponsors should reach out and establish open lines of communication with their legislative representatives to keep them informed about airport-related needs and issues. Airport sponsors also have the opportunity participate in professional airport associations for the purpose of ensuring that state legislatures understand their perspectives when critical airport-related legislation is introduced. By working together through airport associations, airport sponsors can be effective advocates for critical legislation promoting airport land use compatibility.

5.7.11.2 Airport sponsors should also maintain communication with state and local agency officials with responsibilities relating to airport land use compatibility. This may include agencies responsible for overseeing or advising on municipal and county land use planning.

APPENDIX A. GLOSSARY

1. **Aeronautical Activities.** (FAA AC 150/5190-6, *Exclusive Rights at Federally Obligated Airports*)

   Any activity that involves, makes possible, or is required for the operation of aircraft, or that contributes to or is required for the safety of such operations. Activities within this definition, commonly conducted on airports, include, but are not limited to, the following: general and corporate aviation, air taxi and charter operations, scheduled and nonscheduled air carrier operations, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, aircraft sales and services, aircraft storage, sale of aviation petroleum products, repair and maintenance of aircraft, sale of aircraft parts, parachute or ultralight activities, and any other activities that, because of their direct relationship to the operation of aircraft, can appropriately be regarded as aeronautical activities. Activities, such as model aircraft and model rocket operations, are not aeronautical activities.

2. **Aeronautical Study.** (FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, general definition)

   A study performed pursuant to 14 CFR Part 77, "Safe, Efficient Use, and Preservation of the Navigable Airspace," concerning the effect of proposed construction or alternation on the use of air navigation facilities or navigable airspace by aircraft. The conclusion of each study is normally a determination as to whether the specific proposal studied would be a hazard to air navigation and/or a determination for marking and/or lighting. Aeronautical study is also made to define airspace requirements under 14 CFR 157 for planned airport development (e.g. such as a runway extension that may further extend surfaces off airport property thus affecting land use in the immediate area).

3. **Airport.** (14 CFR Part 1)

   An area of land or water that is used or intended to be used for the landing and takeoff of aircraft including its buildings and facilities, if any.

4. **Airport Influence Area.**

   The land use and people in the areas surrounding an airport which can be directly affected by the operation of the airport.

5. **Airport Improvement Program (AIP).** (FAA Order 5100.38)

   Chapter 471 of Title 49 U.S.C. establishes the general requirements and conditions for the Airport Improvement Program (AIP). AIP funding is used to develop a nationwide public-use airport system to meet the country’s current and projected civil aviation needs. The airports comprising that system make up the National Plan of Integrated Airport Systems (NPIAS). FAA Order 5100.38, *Airport Improvement*

Program Handbook, provides details on administering the AIP. Not all activities identified in this AC may be eligible for AIP funding.

6. **Airport Layout Plan (ALP).** (14 CFR Part 152, Airport Aid Program)

The plan of an airport showing the layout of existing and proposed airport facilities on airport property.

7. **Airport Master Plan.** (FAA AC 150/5070-6)

An Airport Master Plan is a presentation of the phased development of a specific airport. It presents the research and logic from which the plan evolved and displays the plan in a graphic and written report. Master plans are applied to the modernization and expansion of existing airports and to site selection and planning for new airports, regardless of their size or functional role. It is desirable that Airport Master Plans be developed within the framework of metropolitan or regional plans or state airport system plans.

8. **Airport Overlay Zone.**

A zone intended to place additional compatible land use conditions on land impacted by the airport while retaining the existing underlying zone.

9. **Airspace.**

The space lying above the earth or above a certain area of land or water that is necessary to conduct aviation operations.

10. **Approach Minimum.**

The height above ground at which a pilot must have the airfield in sight to continue on approach to land. When obstructions exist to runway approaches, the approach minimums are raised, which can limit the utility of the airport in times of reduced visibility or low cloud cover.

11. **Approach Slopes.** (14 CFR Part 77)

The ratios of horizontal to vertical distance indicating the degree of inclination of the Approach Surface. The various ratios include:

- 20:1 – For all utility and visual runways extended from the primary surface a distance of 5,000 feet.
- 34:1 – For all non-precision instrument runways extended from the primary surface for a distance of 10,000 feet.
- 50:1/40:1 – For all precision instrument runways extending from the primary surface for a distance of 10,000 feet at an approach slope of 50.1 and an additional 40,000 feet beyond this at a 40:1 Approach Slope.

12. **Approach Surface.** (14 CFR Part 77)

A surface defined by 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*, that is longitudinally centered on the runway centerline and extends outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based on the type of approach available or planned for that runway end.

13. **Avigation Easement.** (FAA AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects)*

An avigation easement is a conveyance of airspace over another property for use by the airport. The owner of an easement-encumbered property (servient property) has restricted use of their property subject to the airport sponsor's easement (dominant property) for overflight and other applicable restrictions on the use and development of the servient parcel. Easement rights acquired typically include the right-of-flight of aircraft; the right to cause noise, dust, etc.; the right to remove all objects protruding into the airspace together with the right to prohibit future obstructions or interference in the airspace; and the right of ingress/egress on the land to exercise the rights acquired. The avigation easement on the property shall "run with the land" and any future owners' use of the servient parcel is also restricted as described in the avigation easement.

14. **Comprehensive Land Use Plan.**

A governmental entity's official statement of its plans and policies for long-term land use and development. The plan includes maps, graphics and written proposals, which indicate the general location for streets, parks, schools, public buildings, airports and other physical development of the jurisdiction.

15. **Conditional Zoning.**

The imposition or exaction of conditions or promises upon the grant of zoning by the zoning authority.

16. **Federally Obligated Airport.**

An airport sponsor is considered to be a Federally Obligated Airport by either

- Accepting a federal AIP grant for development, equipment, or land; OR
- Accepting property through surplus property (bound by instruments of conveyance and statutory requirements found in 49 U.S.C. 47151, *et seq.*)

An airport sponsor accepting AIP funds must agree with certain obligations, called grant assurances.

17. **General Aviation (GA).**

Refers to all civil aircraft and operations that are not classified as air carrier, commuter or regional. The types of aircraft used in general aviation activities cover a wide spectrum from corporate multi-engine jet aircraft piloted by professional crews to amateur-built single-engine piston acrobatic planes, balloons and dirigibles.

18. **Hazard.**

An existing or proposed object that the FAA, as a result of an aeronautical study, determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities, or existing or potential airport capacity.

Imaginary Surfaces. (14 CFR Part 77)

Those areas established in relation to the airport and to each runway consistent with 14 CFR Part 77 in which any object extending above these imaginary surfaces, by definition, is an obstruction.

- Transitional surface – The transitional surface extends outward and upward at right angles to the runway centerline and extend at a slope of seven feet horizontally for each one-foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to the point at which they intercept the horizontal surface at a height of 150 feet above the established airport elevation.
- Horizontal surface – The horizontal surface is a horizontal plane located 150 feet above the established airport elevation and encompasses an area from the transitional surface to the conical surface. The perimeter is constructed by generating arcs from the center of each end of the primary surface and connecting the adjacent arcs by lines tangent to those arcs.
- Conical surface – The conical surface extends upward and outward from the periphery of the horizontal surface at a slope of 20 feet horizontally for every one-foot vertically (20:1) for a horizontal distance of 4,000 feet.
- Approach surface – The approach surface is longitudinally centered on the extended runway centerline and extends outward and upward from the end of the runway primary surface. The approach slope of a runway is a ratio of 20:1, 34:1, or 50:1, depending on the approach type. The length of the approach surface varies from 5,000 to 50,000 feet and depends upon the approach type.

19. **Land Use Compatibility.**

Airport-compatible land uses are defined as those uses that can coexist with a nearby airport without constraining the safe and efficient operation of the airport or exposing people living or working nearby to unacceptable levels of noise or hazards.

20. **Land Use Controls.**

Measures established by state or local government that are designed to carry out land use planning. The controls include zoning, subdivision regulations, planned acquisition, easements, covenants, or conditions in building codes and capital improvement programs, such as the establishment of sewer, water, utilities, or their service facilities.

21. **Noise Compatibility Program (NCP).** (FAA AC 150/5020-1)

The purpose of such a program is to seek optimal accommodation of both airport operations and community activities within acceptable safety, economic and environmental parameters. That may be accomplished by reducing existing incompatible land uses in the vicinity of the airport and preventing the introduction of new incompatible land uses in the future. To that end, the airport proprietor and other responsible officials should consider a wide range of feasible alternatives of noise control actions and land use patterns.

22. **Noise Exposure Map (NEM).** (FAA AC 150/5020-1)

The NEM is a scaled map of the airport, its noise contours and surrounding land uses. The NEM depicts the levels of noise exposure around the airport, both for the existing conditions and forecasts for the 5-year planning period. The area of noise exposure is designated using the DNL (Day-Night Average Sound Level) noise metric.

23. **Obstacle.**

An existing object at a fixed geographical location or which may be expected at a fixed location within a prescribed area with reference to which vertical clearance is or must be provided during flight operation.

24. **Obstruction.**

An object of greater height than any of the heights or surfaces presented in Subpart C of 14 CFR Part 77, Standards for Determining Obstructions to Air Navigation or Navigational Aids or Facilities.

25. **Special Exceptions.**

Land uses that are not specifically permitted as a matter of right, but can be permitted in accordance with performance standards and other local criteria. Also known as "conditional uses."

26. **Variance.**

An authorization for the construction or maintenance of a building or structure, or for the establishment or maintenance of a use of land that is prohibited by a zoning ordinance. A lawful exception from specific zoning ordinance standards and regulations predicated on the practical difficulties and/or unnecessary hardships on the petitioner being required to comply with those regulations and standards from which an exemption or exception is sought.

27. **Zoning.**

An exercise of the police powers of the state, as delegated to local governments, designating the uses permitted on each parcel of land within the zoning jurisdiction.

28. **Zoning Ordinance.**

Primarily a legal document that allows a local government effective and legal regulation of uses of property while protecting and promoting the public interest.

APPENDIX B. FAA OFFICE OF AIRPORTS

The FAA Airports organization provides leadership in planning and developing a safe and efficient national airport system. The office has responsibility for all programs related to airport safety and inspections and standards for airport design, construction, and operation (including international harmonization of airport standards). The office also is responsible for national airport planning and environmental and social requirements and establishes policies related to airport rates and charges, compliance with grant assurances, and airport privatization. Within this organization, several headquarters offices and divisions are responsible for different programs. For FAA Airports contacts see http://www.faa.gov/airports/news_information/contact_info/.

Figure B-1. FAA Regional Offices

APPENDIX C. FAA LAND USE-RELATED REGULATIONS AND GUIDANCE

This appendix focuses on the primary FAA documents that guide land use related decisions or are related to land use concerns such as wildlife hazard management, noise effects, and safe and efficient use of airspace. Because state and local regulations vary depending on an airport's location, only FAA guidance is summarized in this appendix. However, it must be noted that the items addressed in this appendix be considered in conjunction with applicable state and local laws and regulations. In instances where regulations and/or guidance is contradictory from one governmental unit to another, coordination and negotiation is required with responsible jurisdictions to promote land use compatibility and to protect the safety of the airport operations. In addition, there are additional federal agencies that may have regulations or guidance, which may be applicable on a case-by-case basis and must be considered. **Table C-1** summarizes the sources of FAA regulations and guidance, each of which are discussed in more detail in the following sections.

Table C-1. FAA Planning and Development Regulations and Guidance

Source	Description
Airport Improvement Program (AIP) Grant Assurances	The AIP is an FAA program that provides grants to public agencies — and, in some cases, to private owners and entities - for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). Grant Assurances are the series of conditions that come with these federal grants for aviation projects. These assurances obligate an airport sponsor to protect the federal investment through the maintenance of a safe and unrestricted operating environment.
Code of Federal Regulations (CFR)	Title 14 of the CFR documents the rules prescribed by the FAA governing all U.S. aviation activities.
FAA Orders	Agency-wide orders that give direction and guidance for compliance with FAA directives.
FAA Advisory Circulars (ACs)	A single, uniform, agency-wide system that the FAA uses to deliver advisory material to the industry as a whole without creating or changing a regulatory requirement.
FAA Policy and Procedures Guidance, Standard Operation Procedures, Memorandums (PPMs) and Program Information Memorandums (PIMs)	The intent of FAA guidance documents is to discuss items that are already addressed in FAA published guidance. It does not revise existing guidance, but is intended to provide further explanation on a particular topic.
FAA Program Guidance Letters (PGLs)	Documents that add to or revise guidance about the administration of the AIP found in the AIP Handbook.

Source	Description
	Since 2008, new and revised PPMs have been designated "Regional Guidance Letters."
Other FAA Documents	Additional manuals, reports, and documents developed by the FAA related to land use issues.

C.1 Airport Improvement Program (AIP) Grant Assurances.

C.1.1 Federal money for aviation projects comes with a series of conditions called 'Grant Assurances.' Grant assurances obligate an airport sponsor to protect the federal investment through the maintenance of a safe and unrestricted operating environment. When federal grant funds through the Airport Improvement Program (AIP) are accepted, the grant assurances are incorporated into the grant agreement and become part of the sponsor's legal obligation. Several grant assurances specifically address and enhance airport land use compatibility, including the following:

- Grant Assurance 4 Good Title
- Grant Assurance 5 Preserving Rights and Powers
- Grant Assurance 6 Consistency with Local Plans
- Grant Assurance 7 Consideration of Local Interest
- Grant Assurance 19 Operation and Maintenance
- Grant Assurance 20 Hazard Removal and Mitigation
- Grant Assurance 21 Compatible Land Use

C.2 Code of Federal Regulations (CFRs).

C.2.1 Title 14 of the Code of Federal Regulations (CFR), entitled Aeronautics and Space, contains many regulations that have a bearing on airport land use compatibility issues. Title 14 is organized into six different Chapters, with each Chapter further divided into Subchapters, and each Subchapter further divided into Parts. Each "Part" within Title 14 deals with a distinct topic and/or type of activity and contains a varying amount of regulations. 14 CFR Part 150 addresses the Noise Compatibility Program and establishes the airport noise compatibility planning measures authorized under the Aviation Safety and Noise Abatement Act (ASNA). The Part 150 program is voluntary and open to all publicly owned, public-use airports included in the NPIAS. Participation is mandatory in order to obtain FAA funding for most noise-abatement measures. Part 150 focuses solely on noise compatibility issues. Safety and airspace protection concerns are not addressed except to the extent that they may affect or be affected by noise-related measures.

C.2.2 14 CFR Part 77 addresses objects affecting navigable airspace and establishes standards for providing notice to the FAA regarding proposed objects that may be obstructions to

air navigation. As previously discussed in Chapter 2, under Part 77, the FAA is authorized to undertake an airspace study to determine whether a structure (man-made or naturally occurring) is, or could be, a hazard to air navigation. The FAA is not authorized to regulate tall structures nor is there specific authorization in any federal statute that permits the FAA to limit structure heights or require structures to be lighted or marked. As a result, local land use controls are needed to support the findings of the FAA (hazards and non-hazards).

C.2.3 14 CFR Part 139.337, *Wildlife Hazard Management,* prescribes the specific issues that an airport sponsor must address in a wildlife hazard management plan for FAA approval. The plan is based upon a wildlife hazard assessment that is conducted by a wildlife damage management biologist. Part of the plan can be prepared by the biologist who conducts the wildlife hazard assessment; however, some parts can only be prepared by airport management. Wildlife hazard management plans are critical tools to promote compatible uses near airports and to mitigate effects of incompatible uses that are attractive to wildlife.

C.2.4 40 CFR Part 258, Subpart B, Criteria for Municipal Solid Waste Landfills, Location Restrictions establishes criteria for the expansion and/or development of new landfills with regard to airports. The regulation states that the owners or operators of new Municipal Solid Waste Landfills (MSWLF) units and lateral expansions within 10,000 feet of any runway end used by turbojet aircraft, or within 5,000 feet of any runway end used by piston-type aircraft only, must demonstrate that the units are designed and operated in a way that the MSWLF unit does not pose a bird hazard to aircraft. It also requires owners or operators proposing to site new MSWLF units and lateral expansions within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft to notify the affected airport and the FAA. This regulation is imperative to mitigate wildlife attractants in an airport's vicinity, as landfills are incompatible land uses.

C.3 FAA Orders.

The FAA, as an agency within the Department of Transportation, has promulgated agency-wide orders (known as Agency Orders [AOs]) that give direction and guidance for compliance with FAA directives. In addition to regulations and ACs, several AOs exist that have some impact or relation to compatibility. These are discussed in this section.

- Order 5200.8, *Runway Safety Area Program,* was issued with the objective that all Runway Safety Areas (RSAs) at federally obligated airports and all RSAs at airports certificated under 14 CFR Part 139 conform to the standards contained in AC 150/5300-13A, *Airport Design*, to the extent practicable. Each FAA Regional Airports Division Manager is responsible for implementing the program and is responsible for making a determination as to whether the existing RSA of each runway within their region meets the current design standards and if not, for making a determination as to whether or not it is practicable to improve the RSA so that it will meet current standards. Whenever a project for a runway involves

construction, reconstruction, or significant expansion, the project must also provide for improving the RSA in accordance with the determination made.

- Order 1050.1, *Environmental Impacts: Policies and Procedures,* provides the FAA agency-wide policies and procedures for compliance with the National Environmental Policy Act of 1969 (NEPA) and for implementing regulations issued by the Council on Environmental Quality (40 CFR parts 1500-1508). This revision includes changes for clarification, consistency, addition of information, corrections, and editorial changes.
- Order 5050.4, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* supplements Order 1050.1, *Environmental Impacts: Policies and Procedures.* This order provides the Airports Division specific guidance on how to implement the requirements of NEPA, historical preservation, conservation, and other special purpose laws when performing actions specific to the Airports Division. FAA Order 1050.1 remains the overriding FAA order for implementing NEPA, and takes precedent in the event there is a conflict between the two orders.
- Order 5100.38, *Airport Improvement Program Handbook,* provides grant funding eligibility guidance to be used during the administration of the AIP.
- Order 5190.6, *FAA Airport Compliance Manual*, sets forth policies and procedures for the FAA Airport Compliance Program. The FAA Airport Compliance Program monitors the performance of airport owners to maintain a high degree of safety and efficiency in compliance to their airport design, construction, operation, and maintenance grant assurances and obligations.
- Order 7400.2, *Procedures for Handling Airspace Matters*, specifies procedures in the joint administration of the airspace program. It addresses actions associated with airspace allocation and utilization, obstruction evaluation, obstruction marking and lighting, airport airspace analysis, and the management of air navigation aids.

C.4 FAA Advisory Circulars (ACs).

The AC system provides a single, uniform, agency-wide system that the FAA uses to deliver advisory material to the industry as a whole. ACs provide guidance for complying with regulations and grant assurances but do not create or change a regulatory requirement. Several ACs exist that have some impact or relation to compatibility. They are discussed briefly here:

- FAA AC 150/5300-13, *Airport Design*, provides the basic standards and recommendations for airport design including information regarding approach procedures for RPZs, threshold-siting criteria, and instrument approach categories. The criteria contained in this document are the primary spatial standards for on-airport development.
- AC 70/7460-1, *Obstruction Marking and Lighting,* works within the requirements of 14 CFR Part 77 and requires that an entity proposing any type of construction or

alteration of a structure that may affect the National Airspace System is required to submit FAA Form 7460-1, Notice of Proposed Construction or Alteration.

- AC 150/5070-7, *Airport System Planning Process,* outlines the development of effective airport system planning documents, which provide guidance to establish a balanced integrated system of public-use airports consistent with state or regional goals. The goal of the airport system planning process is to identify, preserve, and enhance the aviation system to meet both current and future demand. Land use compatibility is discussed in many state and/or regional system plans; there is some discussion of land use compatibility planning elements.
- AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects*, provides guidance to sponsors of an airport to develop land acquisition and relocation assistance procedures in conformance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646, as amended). This has relevance to the land use compatibility discussion if acquisition or relocation activities are undertaken as a method to mitigate incompatibility.
- AC 150/5020-1, *Noise Control and Compatibility Planning for Airports*, provides guidance for the implementation of 14 CFR Part 150, which allows for the development of an airport plan that establishes a compatible relationship between land uses and noise-related issues. This is accomplished by the reduction of incompatible land uses around airports and noise sensitive areas, and the prevention of additional incompatible land uses.
- AC 150/5020-2, *Guidance on the Balanced Approach to Noise Management*, provides guidance for noise control and compatibility planning for airports and the guidance for preparing airport noise exposure maps and airport noise compatibility programs implemented in 14 CFR Part 150, and the Aviation Safety and Noise Abatement Act of 1979.
- AC 150/5200-34, *Construction or Establishment of Landfills near Public Airports*, provides guidance regarding compliance with new federal statutory requirements that limit construction or establishment of municipal solid waste landfill (MSWLF) units near public airports, as they are major wildlife attractants.
- AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports,* provides guidance regarding the types of land uses considered incompatible near airports due to their nature as wildlife attractants. These uses include, but are not limited to, wastewater treatment facilities, wetlands, dredge spoil containment areas, and solid waste landfills.
- AC 150/5050-4, *Citizen Participation in Airport Planning*, provides guidance for citizen involvement in airport planning. Although not mandatory for airport grant programs, it explains the need for early citizen participation.

C.5 **Other FAA Guidance Documents.**

- PPM 5190.6, *Guidance for Leases, Use Agreements and Land Releases,* consolidates all of the guidance provided in various FAA publications, policy letters, and other written documentation on the development of leases, use agreements, and land releases that are in accordance with an airport sponsor's federal obligations. The intent of this document is to reduce FAA and airport sponsor research efforts, enhance lease arrangements, and ensure that FAA interests are properly protected on leases and disposals of obligated airport land.
- *FAA Guidance for Management of Acquired Noise Land Inventory, Reuse, and Disposal,* provides guidance for airport sponsors and the FAA to meet the requirements of Grant Assurance 31 when acquiring land under airport noise compatibility programs. Grant Assurance 31 works to assure optimal use is made of the federal share of the proceeds from the disposal of noise land.
- *Wildlife Hazard Management at Airports, A Manual for Airport Personnel,* 2nd Edition, U.S. Department of Transportation, Federal Aviation Administration and U.S. Department of Agriculture, Animal and Plant Health Inspection Service, 2005.
- *Report to Congress on Potential for Use of Land Options in Federally Funded Airport Projects.* Report of the Secretary of Transportation to the United States Congress, Washington, D.C., December 1997.
- *Compliance Guidance Letter (CGL) 2018-3, Appraisal Standards for the Sale and Disposal of Federally Obligated Airport Property,* this CGL assists and informs FAA field offices, airport sponsors, and commercial appraisers on the appraisal process for the sale and leasing of federally obligated airport real property.

APPENDIX D. LIST OF CROPS POSING PARTICULAR WILDLIFE ATTRACTANT PROBLEMS

D.1 The USDA bulletin, "Plants Attractive to Wildlife," provides a list of cultivated plants that can attract wildlife. Wildlife can be attracted to specific cultivated plants as a food source and may be attracted to plants for shelter. According to the bulletin, crops and vegetation that should be discouraged within the vicinity of the airport's environs include, but are not limited to:

- Alfalfa
- Barley
- Corn
- Oats
- Sorghum
- Wheat
- Vineyards
- Apple trees
- Cherry trees

D.2 The presence of these types of crops and vegetation can provide wildlife with not only a food source but also shelter, which can serve as an attractant to various types of wildlife. For example, small mammals can be attracted to planted fields of row crops that provide cover. Large predatory birds are often attracted to these same areas because of the presence of the small mammals, birds, and rodents that hide in the crops and neighboring tall grasses. This can create a detrimental cycle of wildlife attractants that may lead to wildlife and bird strikes with approaching and departing aircraft. Coordination of land use concerns between airports, local communities, and local neighbors, such as farmers and horticulturists, is crucial to reduce the potential of wildlife strikes.

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APPENDIX E. SAMPLE AIRPORT LAND USE COMPATIBILITY PLAN

PURPOSE AND AUTHORITY OF AIRPORT LAND USE COMMISSION

To assist local agencies in ensuring compatible land uses in the vicinity of all new airports and in the vicinity of existing airports to the extent that the land in the vicinity of those airports is not already devoted to incompatible uses.

To coordinate planning at the state, regional, and local levels to provide for the orderly development of air transportation, while at the same time protecting the public health, safety, and welfare.

To prepare and adopt an Airport Land Use Compatibility Plan (ALUCP) pursuant to state and/or local law.

To review the plans, regulations, and other actions of local agencies and airport operators.

The powers of the Airport Land Use Compatibility Commission shall in no way be construed to give the commission jurisdiction over the operation of any airport.

In order to carry out its responsibilities, the commission may adopt rules and regulations consistent with its state or local authorization.

GENERAL ALUCP CONTENT CHECKLIST

Scope of the Plan. In a preface or introductory chapter, provide a clear statement describing the scope and function of the plan. Specifically:

- Refer to state or local statute, ordinance or resolution that provides for the formation of Airport Land Use Compatibility (ALUC) commission (as applicable) and requires preparation of an Airport Land Use Compatibility Plan (ALUCP) for the governing jurisdiction. Include the resolution that formed the ALUC and the resolution that adopts this ALUCP. The plan's purpose should be defined as a vehicle for conducting airport land use compatibility planning.
- Airport Identification: List the airport(s) addressed by the plan and the city or unincorporated county in which they are located.
- Airport Influence Area: Provide a general description and map of the area that comprises the jurisdiction of the ALUC. Also, include a map covering the planning boundary of the ALUCP if it varies from the Airport Influence Area boundary. (see AC at paragraph 4.4.3)
- Jurisdictions Affected: Identify all local jurisdictions and any military facilities that are affected by the ALUCP. Listing the general and specific plans of local jurisdictions also may be valuable.
- Limitations of the Plan: Note the limitations on ALUC jurisdiction over existing land uses; state, federal and tribal land; and airport operations as stated in the law and how they are applied by the individual ALUC.

Airport Information. Include essential information about the airport(s) that shows the ALUCP has been based upon an FAA-adopted Airport Master Plan (AMP) or Airport Layout Plan (ALP).

- Planning Status: Indicate the FAA approval date of the current ALP and activity forecasts (see below). Indicate local government or airport adoption date for the AMP.
- ALP: Include a copy of the FAA-approved ALP.
- Airport Activity: Document existing and projected airport operational levels. Include data indicating the known or estimated distribution of operations by type of aircraft, time of day, and runway used. As necessary, extend the 20-year forecasts included in adopted AMPs to ensure that the ALUCP reflects the anticipated growth of airport activity over a 20-year period.

Compatibility Policies and Criteria. State all policies and criteria as clearly, precisely, and completely as possible, in a separate chapter from background information. As appropriate, use tables to present primary criteria. Address each of the following compatibility concerns:

- Noise: Indicate maximum normally acceptable exterior noise levels for new residential and other noise-sensitive land uses. Note interior noise level standards.
- Overflight: Indicate how aircraft overflight noise concerns are addressed.
- Safety: Indicate maximum acceptable land use densities and intensities and the manner in which they are to be measured. List any uses explicitly prohibited from certain zones.
- Airspace Protection: Note reliance upon 14 CFR Part 77 and Terminal Instrument Procedures (TERPS) if relevant. If applicable, indicate policies addressing objects where ground level exceeds 14 CFR Part 77 criteria. List criteria regarding hazards to flight such as bird strikes, glare), wind turbines, visual obstructions (smoke, haze, etc.), thermal plumes (smoke stacks, cooling towers, etc.) and electronic interferences with flight operations at the airport.

Compatibility Zone Maps. For each airport, provide either a composite compatibility zone map or individual compatibility zone maps. On base map, identify roads, water courses, section lines, and other major natural and man-made features. Showing the local government zoning as a background layer is also helpful.

- Noise Contours: Show CNEL contours to be used for planning purposes.
- Compatibility Policies: If compatibility policies are based on separate assessment of compatibility concerns, indicate boundaries and dimensions of safety zones. When basing zones on guidelines, make adjustments as appropriate to reflect traffic pattern locations and other factors particular to each individual airport.
- FAA Airspace Protection Surfaces: Include map derived from FAR Part 77 standards indicating allowable heights of objects relative to the airport elevation. Indicate locations where ground exceeds these limits. Base map should show topography.

- Composite Compatibility Zones: When using compatibility criteria representing a composite of the above individual compatibility concerns (noise, overflight, safety, and airspace protection) provide a map showing the boundaries of each zone. Indicate distances of boundaries from the airport runways.
- Airport Influence Area (AIA): Clearly identify the AIA boundary on a map and with a written description.

Review Policies. Describe the process and list the steps that the ALUC will use in reviewing local government plans and projects.

- Types of Actions for ALUC Review: List the types of local government plans or projects that are to be submitted to the ALUC. Distinguish between mandatory and voluntary submittals.
- Project Information: List the types of information to be included when a project or plan is submitted for an ALUC consistency decision.
- Timing: Define when ALUC reviews are to be conducted and the time limits within which the ALUC must respond.
- ALUC Staff Responsibilities: Define staff duties in the ALUC compatibility review process.

Preliminary Review of Plans and Projects for Consistency determinations. Describe the steps involved when an affected local jurisdiction requests the ALUC to provide a preliminary assessment of the general plans, specific plans, and relevant land use ordinances and regulations prior to their official submission for an ALUC determination or prior to local approval. The ALUC should make a reasonable effort to identify any direct conflicts needing to be resolved as well as criteria and procedures that need to be defined in order for the local plans to be considered consistent with the ALUCP.

Land Use Information. Include maps such as the following:

- Existing Land Use Development: Show locations in the airport vicinity where development exists by using current, high-altitude aerial photographs, GIS data and available descriptive land parcel data.
- Planned Land Uses: Show locations in the airport vicinity where development is planned by including current general plan and zoning maps.

Discussion of Compatibility Issues. Discuss the basic concepts and rationale behind the compatibility policies and criteria.

Local Government Implementation. Discuss the general plan and any specific ALUCP consistency and documentation requirements. Refer local jurisdictions to the FAA AC 5190-4, *Airport Compatible Land Use Planning*, for sample airport compatibility criteria and implementation documents, such as:

- Land use density and intensities criteria near airports, see AC at 2.2.5,
- Real property disclosure methods, see AC at 5.6,
- Airport Overlay Zone Ordinance, see AC Appendix F, and

- State DOT and other State Agency guidance and programs.

Supporting Materials. For quick reference, include:

- State Aeronautics Act: Provide a copy of the current state laws pertaining to airport land use commissions, airport planning collaboration and consistency. Indicate the date of the most current legislative amendment.
- Title 14 Code of Federal Regulations Part 77: Provide a copy of regulations governing objects affecting navigable airspace.
- Glossary: Prepare a glossary of common aviation terms, particularly those associated with airport land use compatibility planning topics.
- A website link to the state aeronautics office.

EXAMPLE EXISTING ALUCPS

San Diego County Regional Airport Authority - http://www.san.org/Airport-Projects/Land-Use-Compatibility#118076-alucps

City of Ontario CA - http://www.ontarioplan.org/alucp-for-ontario-international-airport/

City/County Association of Governments (C/CAG) of San Mateo County CA - http://ccag.ca.gov/plansreportslibrary/airport-land-use/

APPENDIX F. EXAMPLE AIRPORT LAND USE COMPATIBILITY OVERLAY ZONING ORDINANCE

Sample Airport Land Use & Height Overlay Zoning Ordinance from Iowa Department of Transportation, Office of Aviation

1. Title and Authority:

The _____ AIRPORT LAND USE & HEIGHT OVERLAY ZONING ORDINANCE created by the _____ shall regulate and restrict the height of structures, objects, and growth of natural vegetation, as well as land uses; otherwise regulating the use of property, within the vicinity of the _____ Airport. Creation of appropriate zones and establishing the boundaries thereof, as well as providing for changes in the restrictions and boundaries of such zones is vested in this Ordinance. _____ Airport Land Use & Height Zoning Map is incorporated into and made part of this Ordinance. It is intended that such restrictions will be coordinated with the restrictions existing under the _____ County zoning ordinance.

2. Statement of Purpose and Findings

1. The _____ Airport is acknowledged as an essential public facility to the local community.
2. The creation or establishment of an airport hazard is a public nuisance and poses a potential concern to the surrounding communities served by _____ Airport.
3. There shall be no creation or establishment of a hazard that endangers public health, safety, welfare, or impacts an individual's quality of life, nor prevents the safe movement of aircraft at the _____ Airport.
4. For the protection of the public health, safety, and general welfare, and for the promotion of the most appropriate use of land, it is necessary to prevent the creation or establishment of airport hazards.
5. The prevention of airport hazards shall be accomplished, to the extent legally possible, by proper exercise of the police power.
6. The prevention of new airport hazards, and the elimination, removal, alteration, mitigation, or marking and lighting of existing airport hazards, are considered to be a public purpose for which _____ (City/County) may raise and expend public funds, as an incident to the operation of airports, to acquire or property interest therein.

3. Applicability

This ordinance encompasses the prescribed areas defined in this ordinance around the _____ Airport. See Exhibit A.

4. Definitions

Airport Overlay Zones

Zones intended to place height and land use conditions on land impacted by airport operations while retaining the existing underlying zone. The Title 14 Code of Federal Regulations Part 77 (14 CFR Part 77) Surfaces and runway protection zones have been combined to create five airport overlay zones. The five specific zones create a comprehensive area focused on maintaining compatible land use around airports.

Approach and Runway Protection Zone Map.

The Approach and Runway Protection Zone Map is compiled from the criteria in 14 CFR Part 77, "Objects Affecting Navigable Airspace." It shows the five-airport overlay zones affected by the Airport Overlay Zoning Ordinance, and includes the layout of runways, airport boundaries, elevations, and area topography. Applicable height limitation areas are shown in detail.

Conical Surface (Zone E) - The conical surface extends upward and outward from the periphery of the horizontal surface at a slope of 20 feet horizontally for every one-foot vertically (20:1) for a distance of 4,000 feet. It is the outermost zone of the overlay areas and has the least number of land use restriction considerations.

Horizontal Surface (Zone D) - The horizontal surface is a horizontal plane located 150 feet above the established airport elevation and begins at the edge of the transitional surfaces and primary surface for a distance of 5,000 feet for visual approach runways.

Primary Surface - The primary surface is longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway. When the runway has no specially prepared hard surface, the primary surface ends at each end of that runway. The width of the primary surface is 250 feet, or 50 feet beyond the marked edge of a turf runway.

Runway Protection Zone (RPZ) (Zone A) - The area off the end of the runway end designed to provide a clear area that is free of above ground obstructions and structures to enhance the protection of people and property on the ground. Zone A is intended to provide a clear area that is free of above-ground obstructions and structures.

Runway Approach Surface (Zone B) - A critical overlay surface that reflects the approach and departure areas for each runway at an airport. The approach surface is longitudinally centered on the extended runway centerline, extending outward and upward from the end of the runway. The approach slope for visual runways is 20:1 for a distance of 5,000 feet.

Transitional Surface (Zone C) - The transitional surface extends outward and upward at right angles to the runway centerline and extends at a slope of seven feet horizontally for each one-foot vertically (7:1) from the sides of the primary and approach surfaces. The transitional surfaces extend to the point at which they intercept the horizontal surface at a height of 150 feet above the established airport elevation.

Visual Approach.

An approach to an airport conducted with visual reference to the terrain.

5. Airport Overlay Zones

Airport overlay zones established by this Ordinance include all of the land lying beneath the runway protection zone, the approach surface, transitional surface, horizontal surface and conical surface. These zones are identified as A, B, C, D and E and are defined under the definition section, Table 5.1 and in Exhibit A.

Table 5.1 Dimensions for Airport Overlay Zones - Visual Runway

Zone	Inner Width	Outer Width	Length	Height or Slope
A (Runway Protection Zone – Begins at end of turf runway, 200’ past hard surface runway)	250’	450’	1,000’	Not applicable
B (Approach zone - Begins at end of turf runway, 200’ past hard surface runway)	250’	1,250’	5,000’	20:1
C width (Transitional Surface)		1,050’		7:1
D radius (Horizontal Surface)	Begins at edge of transitional surface	5,000’		150’ above runway (excludes approach zone)
E radius (Conical Surface)	Begins at edge of horizontal surface	4,000’		20:1

6. Airport Zone Height Limitations and Lighting Requirements

Unless otherwise provided for in this Ordinance, no structure, object, natural vegetation, or terrain shall be erected, altered, allowed to grow or be maintained within any airport zone established by this Ordinance to a height in excess of the applicable height limitations established by this Ordinance in Table 5.1 and shown on Exhibit A, the “_____ Airport Zone Overlay Map.”

Lighting and marking requirements will be determined through an FAA 7460-1 airspace analysis. The owner of any structure, object, natural vegetation, or terrain is hereby required to install, operate, and maintain such markers, lights, and other aids to navigation necessary to indicate to the aircraft operators in the vicinity of an airport the presence of an airport hazard.

7. Land Use Limitations within Airport Zones

Land uses defined below as compatible shall be issued a permit if they follow all provisions of this ordinance. Those land uses identified as 'not compatible' will not be permitted within Zones A-E. Land uses identified as 'additional review' will be evaluated by the land use administrator as to the potential impacts on the airport regarding noise, concentration of people, height, visual restrictions, wildlife attractions, flammable substances and electrical, navigational or radio interference.

_____ Airport

Zone Chart

***C** = Compatible* ***AR** = Additional Review Required* ***NC** = Not Compatible*

Land Uses	Zone A	Zone B	Zone C	Zone D	Zone E
Single Family	**NC**	**AR**	**NC**	**AR**	**C**
Multi-Family, group living Uses	**NC**	**NC**	**NC**	**AR**	**C**
Permitted uses in "C" Commercial District	**NC**	**AR**	**AR**	**C**	**C**
Permitted uses in "M" Manufacturing District	**NC**	**AR**	**AR**	**AR**	**C**
Basic Utility Uses (i.e., utility substation facilities, electrical substations, water and sewer lift stations, water towers)	**NC**	**NC**	**NC**	**AR**	**C**
Sanitary landfills	**NC**	**NC**	**NC**	**NC**	**AR**
Solar power, generation equipment, wind generation, wind farms	**NC**	**NC**	**NC**	**AR**	**AR**
Communication transmission facilities	**NC**	**NC**	**NC**	**AR**	**AR**
Outdoor storage, signs and displays	**NC**	**AR**	**AR**	**AR**	**C**
General Community Service	**NC**	**AR**	**AR**	**AR**	**C**
Daycare Uses	**NC**	**NC**	**NC**	**AR**	**C**
Detention Facilities (i.e., prisons, jails, probation centers, juvenile detention homes, halfway houses)	**NC**	**NC**	**NC**	**AR**	**C**
Educational Facilities	**NC**	**NC**	**NC**	**AR**	**C**
Hospitals	**NC**	**NC**	**NC**	**AR**	**C**
Religious Assembly Uses	**NC**	**NC**	**NC**	**AR**	**C**
Communication Transmission Facility Uses (i.e., broadcast, wireless, point to point, emergency towers and antennae)	**NC**	**NC**	**NC**	**AR**	**AR**
Parking Uses (i.e., ground lots, parking structures)	**AR**	**C**	**AR**	**C**	**C**
Transportation Uses (i.e., highways, interstates, local and county roads)	**AR**	**C**	**C**	**C**	**C**
Utility Uses (i.e., solar power	**NC**	**NC**	**NC**	**AR**	**AR**

_____ **Airport** **Zone Chart**					
C *= Compatible*	***AR*** *= Additional Review Required*		***NC*** *= Not Compatible*		
Land Uses	Zone A	Zone B	Zone C	Zone D	Zone E
generation equipment, wind generators, wind farms)					
Farms *– plant and animal with no residential*	**AR**	**AR**	**AR**	**C**	**C**
Resident-related (i.e., single-family home, mobile home if converted to real property and taxed)	**NC**	**AR**	**NC**	**AR**	**C**
Grain bins, bulk fuel, grain elevator	**NC**	**NC**	**NC**	**AR**	**AR**
Man-made water retention, detention, wetlands	**NC**	**NC**	**NC**	**AR**	**AR**
Commercial Recreational Uses (i.e., facilities used for physical exercise, recreation, or culture)					
Outdoor recreation	**NC**	**AR**	**NC**	**AR**	**C**
Indoor recreational facilities	**NC**	**AR**	**NC**	**AR**	**C**
Parks	**NC**	**AR**	**NC**	**C**	**C**
Casino	**NC**	**NC**	**NC**	**AR**	**C**

8. Airport Zoning Map

The Airport Land Use & Height Overlay Zones established by this Ordinance are shown on the Exhibit A to this Ordinance. The Official Airport Land Use & Height Overlay Zoning Map, may be amended, and all notations, references, elevations, data, zone boundaries, and other information thereon, is hereby adopted as part of this Ordinance.

9. Ordinance Administration

It shall be the duty of the _____ referred to herein as the "Airport Zoning Administrator" to administer the regulations prescribed herein. Applications for permits and variances shall be made to the Airport Zoning Administrator upon forms furnished by the Airport Zoning Administrator. Applications for action by the Board of Adjustment shall be forthwith transmitted by the Airport Zoning Administrator should an applicant request review. Permit applications shall be either granted or denied by the Airport Zoning Administrator according to the regulations prescribed herein.

10. Airport Zoning Permits

It shall be the duty of the applicant to provide the Airport Zoning Administrator with sufficient information to evaluate the proposed action. This information shall include but not be limited to the following:

- Contact information

- Structure information
- Site information
- Drawing information
- Certification
- Identify current and potential compatibility concerns

The Airport Zoning Administrator shall evaluate the proposal based upon information provided by the applicant. The Airport Zoning Administrator shall approve the permit if after evaluation, the proposed project is found to be adequately compatible. Should the proposed project be found to be incompatible after review, the Airport Zoning Administrator shall deny the permit. Should the permit be denied, the applicant shall have the right to request a variance or an appeal as prescribed in this Ordinance.

11. Variances

Any person desiring to erect, alter, or increase the height of any structure, object, or to permit the growth of any natural vegetation, or otherwise use his property in violation with any section of this Ordinance, may apply to the Board of Adjustment for variance from such regulation. No application for variance to the requirements of this Ordinance may be considered by the Board of Adjustment unless a copy of the application has been submitted to the _____ Airport Zoning Administrator and the airport manager for an opinion as to the aeronautical effects of the variance.

12. Appeals

Any person, property owner, or taxpayer impacted by any decision of this Ordinance, may appeal to the Board of Adjustment. ***(Insert detail regarding procedures for the appeals process already in use by the adopting governing body.)***

13. Penalties

Any violation of this Ordinance or of any regulation, order, or ruling promulgated hereunder shall constitute a simple misdemeanor, and shall be punishable by a fine of not more than $_____ dollars or imprisonment for not more than _____ (year or month) or both; each day a violation continues to exist shall constitute a separate offense. ***(Insert detail regarding penalties already in use by the adopting governing body.)***

14. Conflicting Regulations

Where there exists a conflict between any of the regulations or limitations prescribed in this Ordinance and any other regulations applicable to the same area, whether the conflict be with respect to height or structures, the use of land, or any other matter, the more stringent limitation or requirement shall govern and prevail.

15. Severability

If any provision of this Ordinance or the application thereof to any person or circumstances is held invalid, such invalidity shall not affect other provisions or applications of the Ordinance, which can be

given effect without the invalid provision or application, and to this end, the provisions of this Ordinance are declared to be severable.

16. Effective Date

This Ordinance shall be in effect from and after its passage by the governing body and publication and posting as required by law.

Adopted on this _____ day of _____, 20__.

Exhibit A-Airport Land Use & Height Overlay Zoning Map

The exhibit provides the Official Airport Land Use & Height Overlay Zoning Maps to be kept on file with the appropriate governmental entities. The maps must be amended when changes occur within the jurisdictional boundaries of the map

Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by—

- Mailing this form to the FAA Office of Airports, Airport Planning and Environmental Division (APP-400) at FAA, APP-400, Room 615, 800 Independence Ave SW, Washington DC 20591; or
- Calling (202) 267-3263 to request an email address to which you can send it; or
- Faxing it to (202) 267-5383.

Subject: AC 150/5190-4B ***Date:*** _____

Please check all appropriate line items:

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ Recommend paragraph _____ on page _____ be changed as follows:

_____
_____
_____

☐ In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

_____
_____
_____

☐ Other comments:

_____
_____
_____

☐ I would like to discuss the above. Please contact me at (phone number, email address).

Submitted by: _____ Date: _____